LANTRONIX®

# EDS1100/2100 User Guide

**Part Number 900-567**
**Revision A March 2010**

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## Disclaimer and Revisions

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide. For the latest revision of this product document, please check our online documentation at www.lantronix.com/support/documentation.

## Compliance

This product has been designed to comply with the limits for a Class A digital device pursuant to FCC Part 15 Subpart B and EN55024:1998 +A2: 2003. Rules when properly enclosed and grounded. These limits are designed to provide reasonable protection against radio interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause interference to radio communications. For more information, see Compliance on page 150.

## Revision History

| Date | Rev. | Comments |
|---|---|---|
| March 2010 | A | Initial Document |

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# 1: About This Guide

This guide describes how to configure, use, and update the EDS1100/2100. It is for software developers and system integrators. This chapter contains the following sections:


- Chapter Summaries
- Conventions
- Additional Documentation


## Chapter Summaries

Table 1-1 lists and summarizes each chapter and appendixes.

***Table 1-1 Chapter/Appendix and Summary***

| Chapter | Summary |
|---|---|
| ***2: Overview*** | Main features of the product and the protocols it supports. Includes technical specifications. |
| ***3: Installation of EDS1100*** | Instructions for installing the EDS1100. |
| ***4: Installation of EDS2100*** | Instructions for installing the EDS2100. |
| ***5: Using DeviceInstaller*** | Instructions for viewing the current configuration using DeviceInstaller. |
| ***6: Configuration Using Web Manager*** | Instructions for accessing Web Manager and using it to configure settings for the EDS1100/2100. |
| ***7: Network Settings*** | Instructions for using the web interface to configure Ethernet settings. |
| ***8: Line and Tunnel Settings*** | Instructions for using the web interface to configure lines and tunnels. |
| ***9: Terminal and Host Settings*** | Instructions for using the web interface to configure terminals and host settings. |
| ***10: Services Settings*** | Instructions for using the web interface to configure settings for DNS, SNMP, FTP, and other services. |
| ***11: Security Settings*** | Description and configuration of SSH and SSL security settings and instructions for using the web interface to configure SSH and SSL security settings. |
| ***12: VIP*** | Information about Virtual IP (VIP) features available on the EDS1100/2100 and instructions for configuring a Virtual IP. |
| ***13: Maintenance and Diagnostics Settings*** | Instructions for using the web interface to maintain the EDS1100/2100, view statistics, files, and logs, and diagnose problems. |
| ***14: Advanced Settings*** | Instructions for using the web interface to configure email, CLI, and XML settings. |
| ***15: Branding the EDS1100/2100*** | Description of PPP on the EDS1100/2100. |

*Table 1-1 Chapter/Appendix and Summary (continued)*

| Chapter | Summary |
|---|---|
| ***16: Updating Firmware*** | Instructions for obtaining the latest firmware and updating the EDS1100/2100. |
| ***A: Technical Support*** | Instructions for contacting Lantronix Technical Support. |
| ***B: Binary to Hexadecimal Conversions*** | Instructions for converting binary values to hexadecimals. |
| ***C: Compliance*** | Lantronix compliance information. |

# Conventions

Table 1-2 lists and describes the conventions used in this book.

*Table 1-2 Conventions Used in This Book*

| Convention | Description |
|---|---|
| **Bold text** | Default parameters. |
| **Brackets [ ]** | Optional parameters. |
| **Angle Brackets < >** | Possible values for parameters. |
| **Pipe \|** | Choice of parameters. |
| **Warning** | ***Warning:*** ***Means that you are in a situation that could cause equipment damage or bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.*** |
| **Note** | ***Note:*** *Means take notice. Notes contain helpful suggestions, information, or references to material not covered in the publication.* |
| **Caution** | ***Caution:*** ***Means you might do something that could result in faulty equipment operation, or loss of data.*** |
| **Screen Font (Courier New)** | CLI terminal sessions and examples of CLI input. |

# Additional Documentation

Visit the Lantronix web site at www.lantronix.com/support/documentation for the latest documentation and the following additional documentation.

- **EDS1100/2100 Quick Start Guide**—Instructions for getting the EDS1100/2100 configured and up and running.
- **EDS1100/2100 Command Reference**—Instructions for accessing Command Mode (the command line interface) using a Telnet connection or through the serial port. Detailed information about the commands. Also provides details for XML configuration and status.
- **DeviceInstaller Online Help**—Instructions for using the Lantronix Windows-based utility to locate the EDS1100/2100 and to view its current settings.

- **Com Port Redirector Quick Start and Online Help**—Instructions for using the Lantronix Windows-based utility to create virtual com ports.
- **Secure Com Port Redirector User Guide**—Instructions for using the Lantronix Windows-based utility to create secure virtual com ports.

# 2: Overview

The EDS1100/2100 Ethernet Device Server is a complete network-enabling solution. It empowers original equipment manufacturers (OEMs) to go to market quickly and easily with Ethernet networking and web page capabilities built into the products.

The EDS1100 and EDS2100 provide the same solution and differ only in the number of serial ports. The EDS1100 has one serial port supported via a DB25 connector. The EDS2100 has two serial ports supported via 2 DB9 connectors.

This chapter contains the following sections:


- Key Product Features
- Applications
- Protocol Support
- Evolution OS™
- Software Features
- Configuration Methods
- Addresses and Port Numbers
- Product Information Label


## Key Product Features

- Power Supply—Regulated 9 - 30 Vdc input required. There is a step-down converter to 1.5 volts for the processor core. All voltages have LC filtering to minimize noises and emissions.
- Controller—A Lantronix DSTni-FX 32-bit microprocessor, running at 166 MHz internal bus and 83 MHz external bus.
- Memory—8 MB Flash and 8 MB SDRAM. Please contact your sales representative if you need larger memory sizes.
- Ethernet—10/100 Mbps Ethernet transceiver.
- Serial Ports—RS232/422/485 high-speed serial ports with all hardware handshaking signals. Baud rate is software selectable (300 bps to 921600 bps).
- Temperature Range—Operates over an extended temperature range of -40°C to +85°C.

## Applications

The EDS1100/2100 device server connects the following types of serial devices to Ethernet networks using the IP protocol family:

- Security, alarm, and access control devices
- Patient monitoring equipment
- Medical instrumentation
- Industrial Manufacturing/Automation systems
- Building Automation equipment
- Point of Sale Systems

- ATM machines
- Data display devices
- Modem
- Time/attendance clocks and terminals

# Protocol Support

The EDS1100/2100 device server supports the following TCP/IP protocols:

- ARP, IP, UDP, TCP, ICMP, BOOTP, DHCP, Auto IP, Telnet, DNS, FTP, TFTP, HTTP/HTTPS, SSH, SSL/TLS, SNMP, SMTP, RSS, PPP and Syslog for network communications and management.
- TCP, UDP, TCP/AES, UDP/AES, Telnet, SSH and SSL/TLS for tunneling to the serial port.
- TFTP, FTP, and HTTP for firmware upgrades and uploading files.

# Evolution OS™

The EDS1100/2100 features the Lantronix Evolution OS™. Key features of the Evolution OS™ include:

- Built-in Web server for configuration and troubleshooting from Web-based browsers
- CLI configurability
- SNMP management
- XML data transport and configurability
- Really Simple Syndication (RSS) information feeds
- Enterprise-grade security with SSL and SSH
- Comprehensive troubleshooting tools

# Software Features

## Modem Emulation

In modem emulation mode, the EDS1100/2100 can replace dial-up modems. The unit accepts modem AT commands on the serial port, and then establishes a network connection to the end device, leveraging network connections and bandwidth to eliminate dedicated modems and phone lines.

## Web-Based Configuration and Troubleshooting

Built upon Internet-based standards, the EDS1100/2100 enables configuration, management, and troubleshooting by using a browser-based interface accessible anytime from anywhere. As a result, downtime gets decreased by using the troubleshooting tools and by using the configuration tools for configuration tasks.

## Command-Line Interface (CLI)

Making the edge-to-enterprise vision a reality, the EDS1100/2100 with the Evolution OS™ uses industry-standard tools for configuration, communication, and control. For example, the Evolution OS™ uses a Command Line Interface (CLI) whose syntax is very similar to that used by data center equipment such as routers and hubs.

## VIP Access

Virtual IP Access is the Lantronix technology that solves the access-through-firewall problem. With VIP Access, the EDS1100/2100 can act as a ManageLinx DSC and provide direct access to your equipment behind a firewall.

## SNMP Management

The EDS1100/2100 supports full SNMP management, making it ideal for applications where device management and monitoring are critical. These features allow networks with SNMP capabilities to correctly diagnose and monitor EDS1100/2100.

## XML-Based Architecture and Device Control

XML is a fundamental building block for the future growth of M2M networks. The EDS1100/2100 supports XML-based configuration setup records that make device configuration transparent to users and administrators. The XML is easily editable with a standard text or XML editor.

## Really Simple Syndication (RSS)

The EDS1100/2100 supports Really Simple Syndication (RSS) for streaming and managing on-line content. RSS feeds all the configuration changes that occur on the device. An RSS aggregator then reads (polls) the feed. More powerful than simple email alerts, RSS uses XML as an underlying Web page transport and adds intelligence to the networked device, while not taxing already overloaded email systems.

## Enterprise-Grade Security

Evolution OS™ provides the EDS1100/2100 the highest level of networking security possible. This ‘data center grade’ protection ensures that each device on the M2M network carries the same level of security as traditional IT networking equipment in the corporate data center.

By protecting the privacy of serial data transmitted across public networks, users can maintain their existing investment in serial technology, while taking advantage of the highest data-protection levels possible.

SSH and SSL can:

- Verify the data received came from the proper source.
- Validate that the data transferred from the source over the network has not changed when it arrives at its destination (shared secret and hashing).
- Encrypt data to protect it from prying eyes and nefarious individuals.
- Provide the ability to run popular M2M protocols over a secure SSH or SSL connection.

In addition to keeping data safe and accessible, the EDS1100/2100 has robust defenses to hostile Internet attacks such as denial of service (DoS), which can be used to take down the network. Moreover, the EDS1100/2100 cannot be used to bring down other devices on the network.

You can use the EDS1100/2100 with the Lantronix Secure Com Port Redirector (SCPR) to encrypt COM port-based communications between PCs and virtually any electronic device. SCPR is a Windows application that creates a secure communications path over a network between the computer and serial-based devices that are traditionally controlled via a COM port. With SCPR installed at each computer, computers that were formerly “hard-wired” by serial cabling for security purposes or to accommodate applications that only understood serial data can instead communicate over an Ethernet network or the Internet.

### Terminal Server/Device Management

Remote offices can have routers, PBXs, servers and other networking equipment that require remote management from the corporate facility. The EDS1100/2100 easily attaches to the serial ports on a server, Private Branch Exchange (PBX), or other networking equipment to deliver central, remote monitoring and management capability.

### Troubleshooting Capabilities

The EDS1100/2100 offers a comprehensive diagnostic toolset that lets you troubleshoot problems quickly and easily. Available from the Web Manager, CLI, and XML interfaces, the diagnostic tools let you:

- View critical hardware, memory, MIB-II, buffer pool, and IP socket information.
- Perform ping and traceroute operations.
- Conduct forward or backup DNS lookup operations.
- View all processes currently running on the EDS1100/2100, including CPU utilization and total stack space available.

## Configuration Methods

After installation, the EDS1100/2100 requires configuration. For the unit to operate correctly on a network, it must have a unique IP address on the network. There are four basic methods for logging into the EDS1100/2100 and assigning IP addresses and other configurable settings:

- DeviceInstaller—Configure the IP address and related settings and view current settings on the EDS1100/2100 using a PC GUI attached to a network. See Using DeviceInstaller on page 30.
- Web Manager—Use a web browser to configure the EDS1100/2100 settings using the Lantronix Web Manager. See Configuration Using Web Manager on page 32.
- Command Line Interface (CLI)—There are two methods for accessing CLI: making a Telnet connection or connecting a terminal (or a PC running a terminal emulation program) to the serial port. Refer to the *EDS1100/2100 Command Reference Guide* for instructions and available commands.
- XML—The EDS1100/2100 supports XML-based configuration and setup records that make device configuration transparent to users and administrators. XML is easily editable with a standard text or XML editor. Refer to the *EDS1100/2100 Command Reference Guide* for instructions and available commands.

# Addresses and Port Numbers

## Hardware Address

The hardware address is also referred to as the Ethernet address or MAC address. The first three bytes of the Ethernet address are fixed and read 00-20-4A, identifying the unit as a Lantronix product. The fourth, fifth, and sixth bytes are unique numbers assigned to each unit. The following sample shows a hardware address:

00-20-4A-14-01-18

or

00:20:4A:14:01:18

## IP Address

Every device connected to an IP network must have a unique IP address. This address references the specific unit.

## Port Numbers

Every TCP connection and every UDP datagram is defined by a destination and source IP address, and a destination and source port number. For example, a Telnet server commonly uses port number 23.

The following is a list of the default server port numbers running on the EDS1100/2100:

- TCP Port 22—SSH Server (Command Mode configuration)
- TCP Port 23—Telnet Server (Command Mode configuration)
- TCP Port 80—HTTP (Web Manager configuration)
- TCP Port 443—HTTPS (Web Manager configuration)
- UDP Port 161—SNMP
- TCP Port 21—FTP
- UDP Port 69—TFTP
- UDP Port 30718—LDP (Lantronix Discovery Protocol) port
- TCP/UDP Port 10001—Tunnel 1
- TCP/UDP Port 10002—Tunnel 2

# Product Information Label

The bottom of each unit (not shown) has a product information label. The label contains the following information:

- Product ID (name)
- Product description
- Bar code
- Part number
- Serial number (which is the hardware address, also referred to as Ethernet or MAC address)
- Agency certifications

# 3: Installation of EDS1100

This chapter describes how to install the EDS1100 device server. It contains the following sections:


- Package Contents
- User-Supplied Items
- Hardware Components
- Installing the EDS1100


## Package Contents

The EDS1100 package includes the following items:

- One EDS1100 device
- One DB25M-to-DB9F serial cable
- Power Cube, 100-240 VAC with international adapters
- Power cord restraint
- Printed *Quick Start Guide*

## User-Supplied Items

To complete your installation, you need the following items:

- RS-232/422/485 serial device that requires network connectivity.
- A serial cable, as in the following list, for your serial device. One end of the cable must have a male DB25 connector for the serial port.
  - A null modem cable to connect the serial port to a DCE device.
  - A straight-through modem cable, such as the one supplied in the package, to connect the serial port to a DTE device.
- An available connection to your Ethernet network and an Ethernet cable.
- A working power outlet if the unit will be powered from an AC outlet.

## Hardware Components

The EDS1100 has a female DB25 serial port that supports RS-232, RS-422, and RS-485 serial devices. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control. Figure 3-1 shows the front panel.

***Figure 3-1 EDS1100 DB25 (Female) Serial Port***

Figure 3-2 shows the RS-232 pinout configuration.

***Figure 3-2 EDS1100 RS-232 Pinouts***

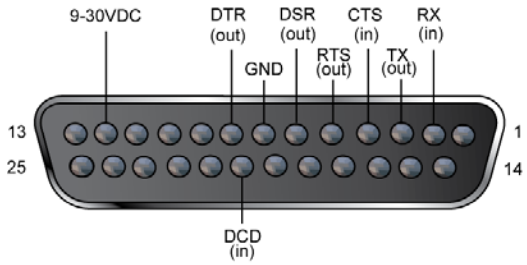



Figure 3-3 shows the RS-422 (4-wire) pinout configuration.

***Figure 3-3 EDS1100 RS-422 (4-wire) Pinouts***

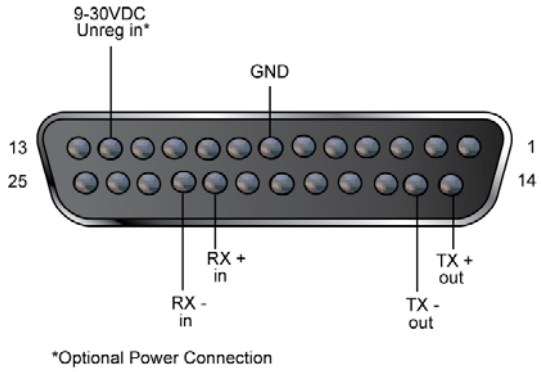
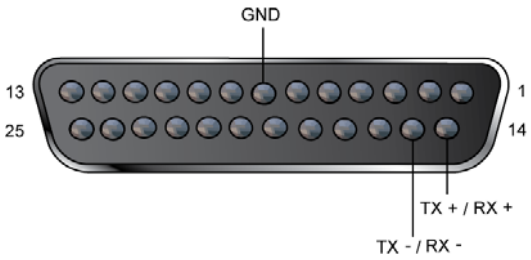



Figure 3-3 shows the RS-485 (2-wire) pinout configuration.

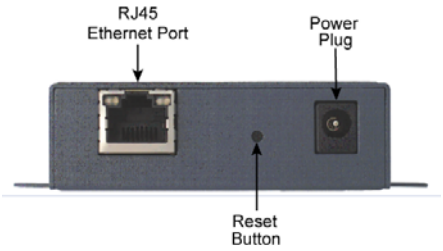
***Figure 3-4 EDS1100 RS-485 (2-wire) Pinouts***



## Back Panel

On the EDS1100 back panel, there is a power plug, reset button, and an RJ45 (10/100) Ethernet port as shown in Figure 3-5.

***Figure 3-5 EDS1100 Back Panel***




The Ethernet port has two LEDs that indicate the status of the connection.

- **Left LED**
  - Green ON 100Mbps Link
  - Green Blink 100Mbps Activity
  - Orange ON 10Mbps Link
  - Orange Blink 10Mbps Activity
- **Right LED**
  - Green ON Full Duplex
  - OFF Half Duplex

The Ethernet port can connect to an Ethernet (10 Mbps) or Fast Ethernet (100 Mbps) network.

## Reset Button

You can reset the EDS1100 to factory defaults, including clearing the network settings. The IP address, gateway, and netmask are set to 00s.

To reset the unit to factory defaults, perform the following steps.

1. Place the end of a paper clip or similar object into the reset opening (back panel) and press for a minimum of 3 seconds.
2. Remove the paper clip to release the button. The firmware restores factory default settings to the configuration and reboots the unit.

## Top LEDs

Figure 3-6 shows the top of the EDS1100 and Table 3-1 lists and describes the LEDs that are on the top of the device.

*Figure 3-6 EDS1100 Top LEDs*

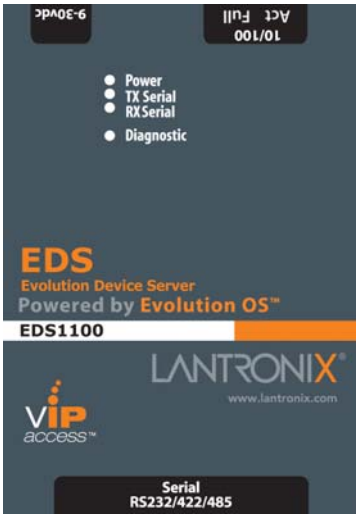



*Table 3-1 EDS1100 LEDs and Descriptions*

| LED | Description |
|---|---|
| **Power (blue)** | ON—EDS is receiving power |
| **TX Serial (green)** | Blinking—EDS is transmitting data on the serial port |
| **RX Serial (yellow)** | Blinking—EDS is receiving data on the serial port |
| **Diagnostic** | ON—EDS firmware has completed booting<br>Blinking 1x/sec—EDS firmware is booting<br>Blinking 2x/sec—EDS is writing a file to flash<br>Blinking 4x/sec—EDS is compacting the file system<br>Blinking 5x/sec—EDS is restoring factory defaults |

# Installing the EDS1100

Be sure to place the device on a flat horizontal or vertical surface. The device comes with mounting brackets for mounting the device vertically, for example on a wall. If using AC power, avoid outlets controlled by a wall switch.

Observe the following guidelines when connecting the serial devices:

- The EDS1100 serial ports support RS-232/422/485 devices.
- The null modem cable is the best cable to connect the serial port to a DCE device. The straight-though (modem) cable is the best cable to connect the serial port to a DTE device.
- Power-up the device by using the barrel-power connector only. The barrel-power connector supports a power range of 9 to 30 VDC.

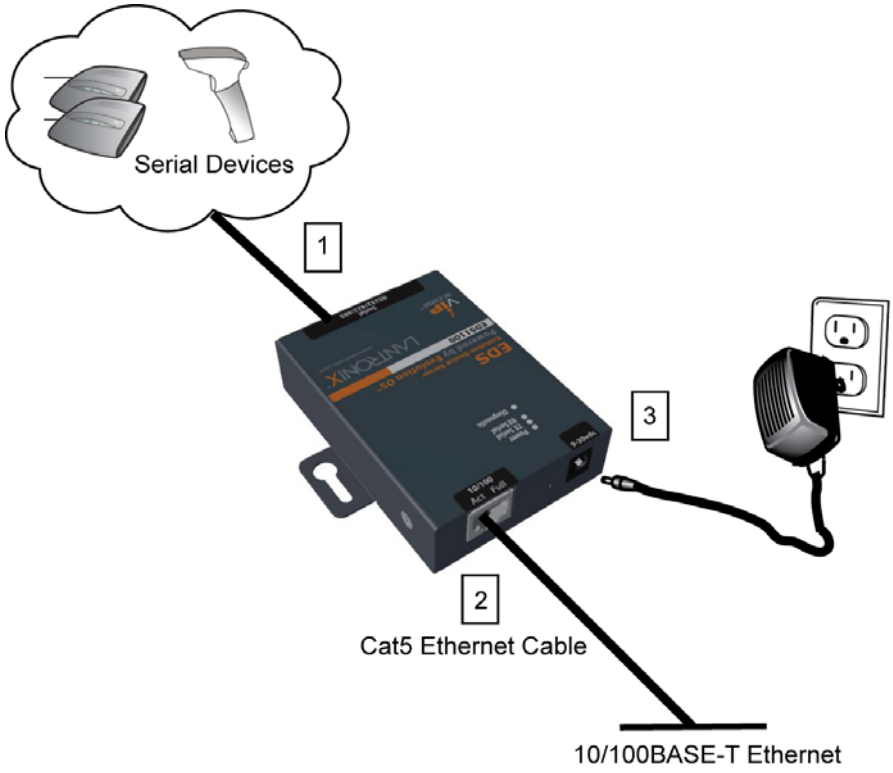
***Note:*** *As soon as you plug the device into power, the device powers up automatically, the self-test begins, and Evolution OS™ starts.*

Perform the following steps to install your device. The steps are shown in Figure 3-7.

1. Connect a serial device to your unit.

2. Connect an Ethernet cable between the EDS1100 RJ45 port and your Ethernet network.
3. Plug the EDS1100 into the power outlet by using the power supply that was included in the packaging. The required input voltage is 9-30 VDC (center +) with 1.5W maximum power required.
4. Power up the serial device.

***Figure 3-7 EDS1100 Connections***



# 4: Installation of EDS2100

This chapter describes how to install the EDS2100 device server. It contains the following sections:


- Package Contents
- User-Supplied Items
- Hardware Components
- Installing the EDS2100


## Package Contents

The EDS2100 package includes the following items:

- One EDS2100 device
- One DB9F-to-DB9F serial null modem cable
- Power Cube, 100-240 VAC with international adapters
- Power cord restraint
- Printed *Quick Start Guide*

## User-Supplied Items

To complete your installation, you need the following items:

- RS-232/422/485 serial devices that require network connectivity.
- A serial cable, as listed below, for each serial device. One end of the cable must have a female DB9 connector for the serial port.
  - A null modem cable, such as the one supplied in your EDS2100 package, to connect the serial port to another DTE device.
  - A straight-through modem cable to connect the serial port to a DCE device.
- An available connection to your Ethernet network and an Ethernet cable.
- A working power outlet if the unit will be powered from an AC outlet.

## Hardware Components

The EDS2100 has two male DB9 serial ports that support RS-232/422/485. Figure 4-1 shows the front of the device. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.

***Figure 4-1 EDS2100 Male DB9 DTE Serial Ports***

The RS-232 pinout configuration is shown in Figure 4-2.

*Figure 4-2 EDS2100 Pinout Configuration for RS-232*

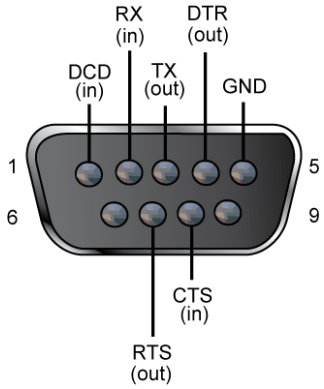



Figure 4-3 shows the pinout configuration for RS-422 (4-wire).

*Figure 4-3 EDS2100 Pinout Configuration for RS-422 (4-wire)*

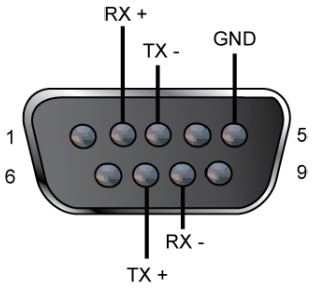
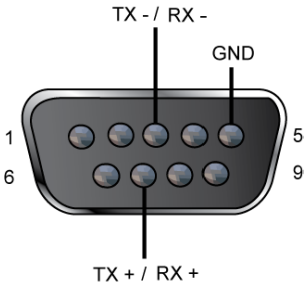



Figure 4-4 shows the pinout configuration for RS-485 (2-wire).

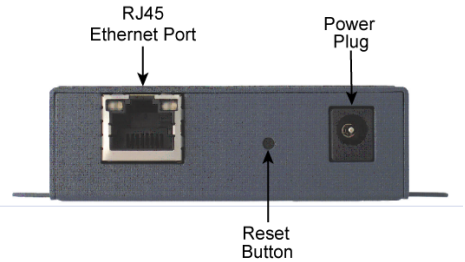
*Figure 4-4 EDS2100 Pinout Configuration for RS-485 (2-wire)*




## Back Panel

On the EDS2100 back panel, there is a power plug, reset button, and an RJ45 (10/100) Ethernet port as shown in Figure 4-5.

*Figure 4-5 EDS2100 Ethernet RJ45 Port, Reset Button, and Power Plug*



The Ethernet port has two LEDs that indicate the status of the connection as follows:

- **Left LED**
  - Green ON 100Mbps Link
  - Green Blink 100Mbps Activity
  - Orange ON 10Mbps Link
  - Orange Blink 10Mbps Activity.
- **Right LED**
  - Green ON Full Duplex.
  - OFF Half Duplex

The Ethernet port can connect to an Ethernet (10 Mbps) or Fast Ethernet (100 Mbps) network.

## Reset Button

You can reset the EDS2100 to factory defaults, including clearing the network settings. The IP address, gateway, and netmask are set to 00s. To reset the unit to factory defaults, perform the following steps.

1. Place the end of a paper clip or similar object into the reset opening and press for a minimum of 3 seconds.
2. Remove the paper clip to release the button. The firmware restores factory default settings to the configuration and reboots the unit.

## Top LEDs

Figure 4-6 shows the top of the EDS2100. Table 4-1 lists and describes the LEDs.

***Figure 4-6 EDS2100 Top LEDs***

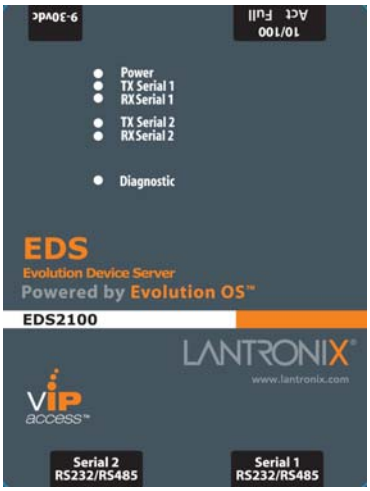



***Table 4-1 EDS2100 LEDs and Descriptions***

| LED | Description |
|---|---|
| **Power (blue)** | ON—EDS is receiving power |
| **TX Serial 1 (green)** | Blinking—EDS is transmitting data on serial port 1 |
| **RX Serial 1 (yellow)** | Blinking—EDS is receiving data on serial port 1 |

*Table 4-1 EDS2100 LEDs and Descriptions (continued)*

| LED | Description |
|---|---|
| **TX Serial 2 (green)** | Blinking—EDS is transmitting data on serial port 2 |
| **RX Serial 2 (yellow)** | Blinking—EDS is receiving data on serial port 2 |
| **Diagnostic** | ON—EDS firmware has completed booting<br>Blinking 1x/sec—EDS firmware is booting<br>Blinking 2x/sec—EDS is writing a file to flash<br>Blinking 4x/sec—EDS is compacting the file system<br>Blinking 5x/sec— EDS is restoring factory defaults |

# Installing the EDS2100

Be sure to place the device on a flat horizontal or vertical surface. The device comes with mounting brackets for mounting the device vertically, for example on a wall. If using AC power, avoid outlets controlled by a wall switch.

Observe the following guidelines when connecting the serial devices:

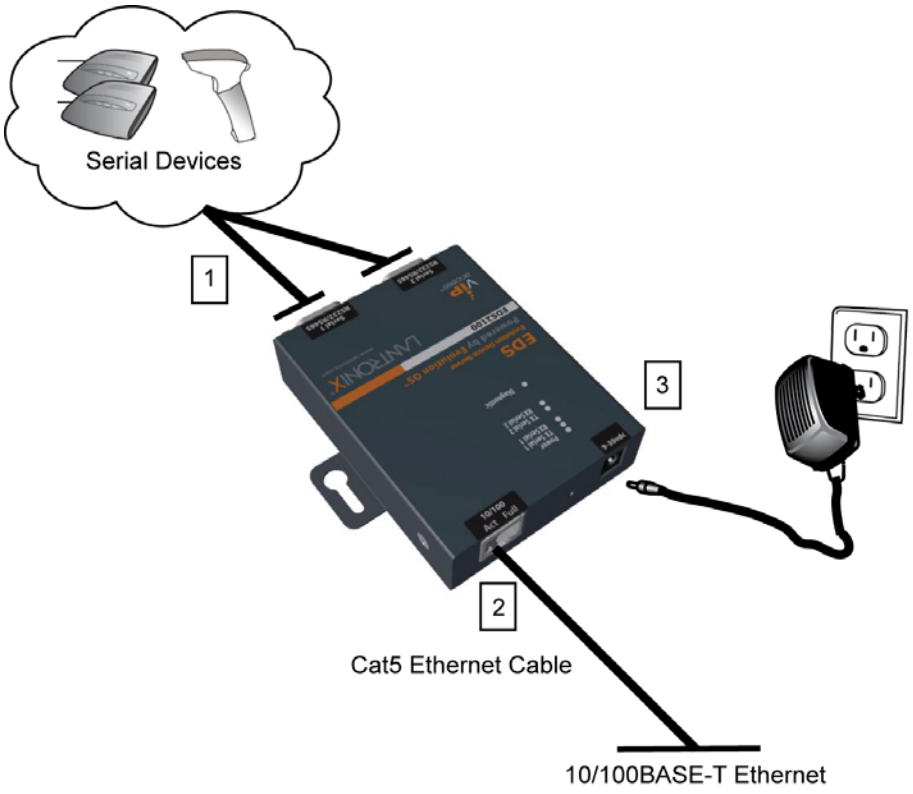
- The EDS2100 serial ports support RS-232/422/485 devices.
- The null modem cable is the best cable to connect the serial port to another DTE device. The straight-though (modem) cable is the best cable to connect the serial port to a DCE device.
- Power-up the device by using the Barrel-power connector only. The barrel-power connector supports a power range of 9 to 30 VDC.

***Note:*** *As soon as you plug the device into power, the device powers up automatically, the self-test begins, and Evolution OS™ starts.*

Perform the following steps to install your device which are numbered in Figure 4-7 also.

1. Connect a serial device to your unit.
2. Connect an Ethernet cable between the EDS2100 RJ45 port and your Ethernet network.
3. Plug the EDS2100 into the power outlet by using the power supply that was included in the packaging. The required input voltage is 9-30 VDC (center +) with1.5W maximum power required.
4. Power up the serial devices.

***Figure 4-7 EDS2100 Connections***



# 5: Using DeviceInstaller

This chapter covers the steps for locating a EDS1100/2100 unit and viewing its properties and device details. It contains the following sections:

- Accessing EDS1100/2100 using DeviceInstaller
- Device Details Summary

DeviceInstaller is a free utility program provided by Lantronix that discovers, configures, upgrades, and manages Lantronix Device Servers. It can be downloaded from the Lantronix website at www.lantronix.com/support/downloads.html. For instructions on using DeviceInstaller to configure the IP address and related settings or for more advanced features, see the DeviceInstaller online Help.

***Note:*** *AutoIP generates a random IP address in the range of 169.254.0.1 to 169.254.255.254 if no BOOTP or DHCP server is found.*

## Accessing EDS1100/2100 using DeviceInstaller

***Note:*** *Keep a record of the MAC address because the MAC address is required to locate the EDS1100/2100 using DeviceInstaller.*

1. Click **Start > All Programs > Lantronix > DeviceInstaller > DeviceInstaller**. When DeviceInstaller starts, it performs a network device search. To perform another search, click the Search button.
2. Expand the EDS folder by clicking the plus (**+**) symbol next to the folder icon. The list of available Lantronix EDS1100 and EDS2100 devices displays.
3. Select the EDS1100 or EDS2100 by expanding its entry and clicking on its hardware (MAC) address to view its configuration.
4. Click the **Device Details** tab, on the right. The current EDS1100/2100 configuration displays. This is only a subset of the complete configuration; access the complete configuration by using the Web Manager, CLI, or XML.

## Device Details Summary

Table 5-1 lists and describes the display only settings unless otherwise noted.

***Table 5-1 Current Settings and Description***

| Current Settings | Description |
|---|---|
| **Name** | Name identifying the EDS1100/2100. |
| **Group** | **Configurable field**. Enter a group to categorize the EDS1100/2100. Double-click the field, type in the value, and press Enter to complete. This group name is local to this PC and is not visible on other PCs or laptops using DeviceInstaller. |
| **Comments** | **Configurable field**. Enter comments for the EDS1100/2100. Double-click the field, type in the value, and press Enter to complete. This description or comment is local to this PC and is not visible on other PCs or laptops using DeviceInstaller. |

*Table 5-1 Current Settings and Description (continued)*

| Current Settings | Description |
|---|---|
| **Device Family** | Shows the EDS1100/2100 device family type as “EDS”. |
| **Type** | Shows the device type as either EDS1100 or 2100. |
| **ID** | Shows the EDS1100 or 2100 ID embedded within the unit. |
| **Hardware Address** | Shows the EDS1100/2100 hardware (MAC) address. |
| **Firmware Version** | Shows the firmware currently installed on the EDS1100/2100. |
| **Extended Firmware Version** | Provides additional information on the firmware version. |
| **Online Status** | Shows the EDS1100/2100 status as Online, Offline, Unreachable (the EDS1100/2100 is on a different subnet), or Busy (the EDS1100/2100 is currently performing a task). |
| **IP Address** | Shows the EDS1100/2100 current IP address. To change the IP address, click the Assign IP button on the DeviceInstaller menu bar. |
| **IP Address was Obtained** | Displays dynamically if the EDS1100/2100 automatically received an IP address (e.g., from DHCP). Displays statically if the IP address was configured manually.<br>If the IP address was assigned dynamically, the following fields appear:<br>◆ Obtain via DHCP with values of True or False.<br>◆ Obtain via BOOTP with values of True or False. |
| **Subnet Mask** | Shows the subnet mask specifying the network segment on which the EDS1100/2100 resides. |
| **Gateway** | Shows the IP address of the router of this network. There is no default. |
| **Number of Ports** | Shows the number of serial ports on this EDS1100/2100. |
| **Supports Configurable Pins** | Shows False, indicating that configurable pins are not available on the EDS1100/2100. |
| **Supports Email Triggers** | Shows True, indicating email triggers are available on the EDS1100/2100. |
| **Telnet Enabled** | Indicates whether Telnet is enabled on this EDS1100/2100. |
| **Telnet Port** | Shows the EDS1100/2100 port for Telnet sessions. |
| **Web Enabled** | Indicates whether Web Manager access is enabled on this EDS1100/2100. |
| **Web Port** | Shows the EDS1100/2100 port for Web Manager configuration. |
| **Firmware Upgradeable** | Shows True, indicating the EDS1100/2100 firmware is upgradeable as newer versions become available. |

# 6: Configuration Using Web Manager

This chapter describes how to configure the EDS1100/2100 by using Web Manager, the Lantronix browser-based configuration tool. The configuration is stored in nonvolatile memory and is retained without power. All changes take effect immediately, unless otherwise noted. It contains the following sections:


- Accessing Web Manager
- Web Manager
- Navigating the Web Manager


## Accessing Web Manager

***Note:*** *You can also access the Web Manager by selecting the Web Configuration tab on the DeviceInstaller window.*

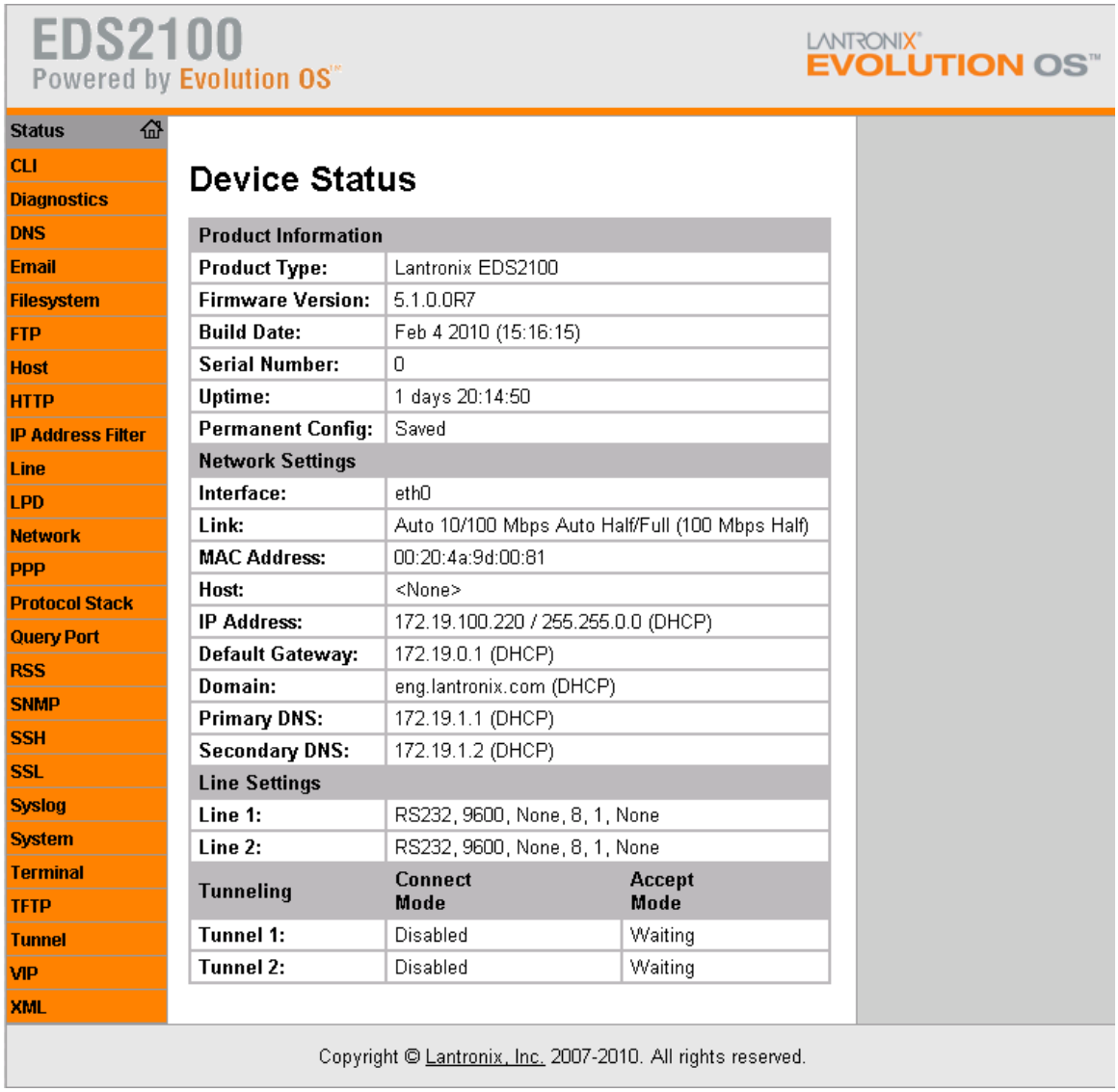
To access the Web Manager, perform the following steps.

1. Open a standard web browser. Lantronix supports the latest version of Internet Explorer, Mozilla Suite, Mozilla Firefox, or Opera.
2. Enter the IP address of the EDS1100/2100 in the address bar. The IP address may have been assigned manually using DeviceInstaller or the serial port (see the *EDS1100/2100 Quick Start Guide*) or automatically by DHCP.
3. Enter your username and password.The factory-default username is “admin” and the factory-default password is “PASS.” The Device Status web page shown in Figure 6-1 displays configuration, network settings, line settings, tunneling settings, and product information.

### Device Status Page

The Device Status page is the first page that appears after you log into the Web Manager. It also appears when you click **Status** in the Main Menu.

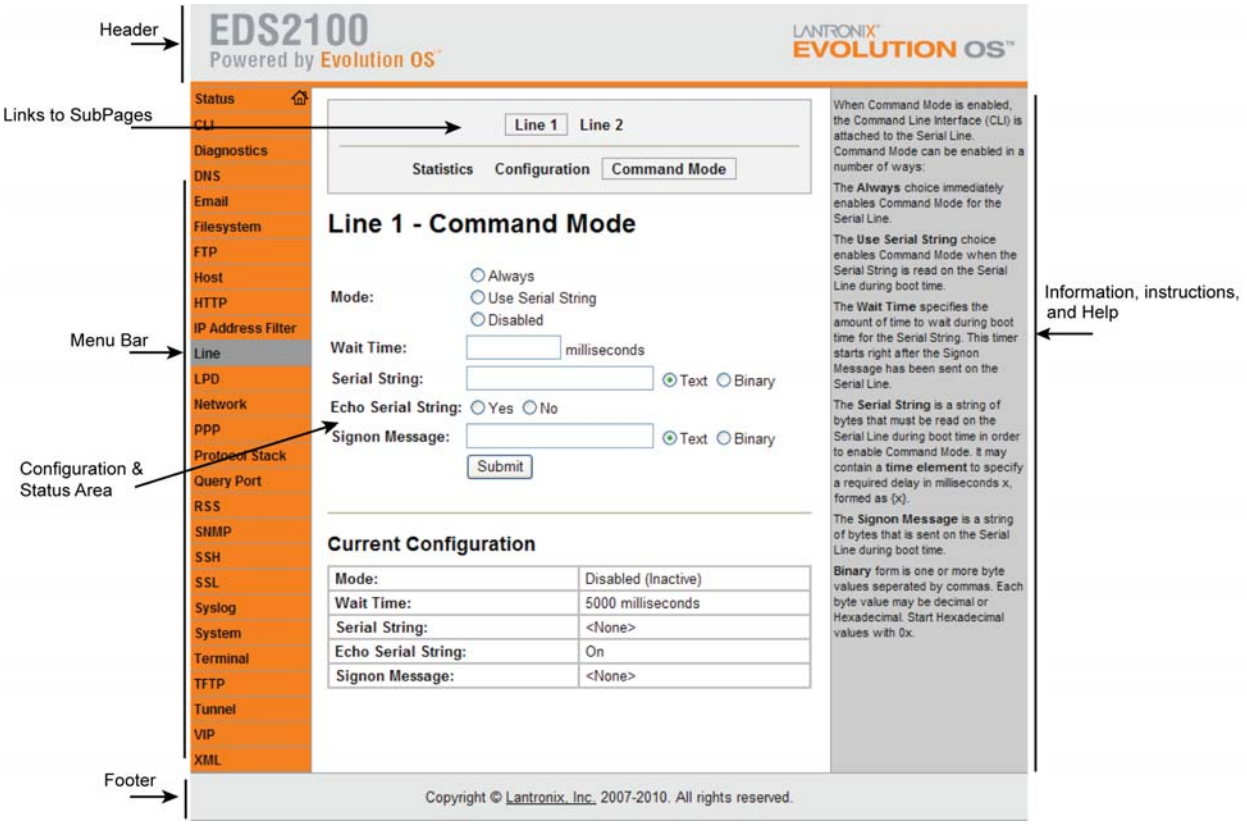
*Figure 6-1 Web Manager Home Page*




# Web Manager

Figure 6-2 shows the components of a typical Web Manager page.

*Figure 6-2 Components of a Typical Web Manager Page*


Header
Links to SubPages
Menu Bar
Configuration & Status Area
Footer
Information, instructions, and Help
EDS2100
Powered by Evolution OS
LANTRONIX EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Line 1 Line 2
Statistics Configuration Command Mode
Line 1 - Command Mode
Mode: Always Use Serial String Disabled
Wait Time: milliseconds
Serial String: Text Binary
Echo Serial String: Yes No
Signon Message: Text Binary
Submit
Current Configuration
Mode: Disabled (Inactive)
Wait Time: 5000 milliseconds
Serial String: <None>
Echo Serial String: On
Signon Message: <None>
When Command Mode is enabled, the Command Line Interface (CLI) is attached to the Serial Line. Command Mode can be enabled in a number of ways:
The Always choice immediately enables Command Mode for the Serial Line.
The Use Serial String choice enables Command Mode when the Serial String is read on the Serial Line during boot time.
The Wait Time specifies the amount of time to wait during boot time for the Serial String. This timer starts right after the Signon Message has been sent on the Serial Line.
The Serial String is a string of bytes that must be read on the Serial Line during boot time in order to enable Command Mode. It may contain a time element to specify a required delay in milliseconds x, formed as {x}.
The Signon Message is a string of bytes that is sent on the Serial Line during boot time.
Binary form is one or more byte values seperated by commas. Each byte value may be decimal or Hexadecimal. Start Hexadecimal values with 0x.
Copyright © Lantronix, Inc. 2007-2010. All rights reserved.

The Menu Bar (orange) always appears at the left side of the web page. There are accessible sections listed in the Main Menu, such as CLI, Diagnostics, Protocol Stack, etc. To display one of these sections, click it.

The Help displays on the right side of the web page and contains information or instructions associated with the page.

The center of a web page contains the following additional sections:

- At the top, there are links to configurable fields. The links often indicate the configurable field, for example, Line, Host, or Tunnel.
- In the middle, you can select or enter new configuration settings. Some pages display statistics or status in this area rather than allow you to enter settings.
- At the bottom, the current configuration displays. In some cases, you can reset or clear a setting.
- At the very bottom, the copyright information displays with a link to the Lantronix home page.

## Navigating the Web Manager

The Web Manager provides an intuitive point-and-click interface. A menu bar on the left side of each page provides links you can click to navigate from one page to another. Some pages are read-only, while others let you change configuration settings.

***Note:*** *There may be times when you must reboot the EDS1100/2100 for the new configuration settings to take effect. The chapters that follow indicate when a change requires a reboot.*

***Table 6-3 Summary of Web Manager Pages***

| Web Manager Page | Description | Page |
|---|---|---|
| **Status** | Shows product information and network, line, and tunneling settings. | 33 |
| **CLI** | Shows Command Line Interface (CLI) statistics and lets you change the current CLI configuration settings. | 131 |
| **Diagnostics** | Lets you perform various diagnostic procedures. | 107 |
| **DNS** | Shows the current configuration of the DNS subsystem and the DNS cache. | 73 |
| **Email** | Shows email statistics and lets you clear the email log, configure email settings, and send an email. | 129 |
| **Filesystem** | Shows file system statistics and lets you browse the file system to view a file, create a file or directory, upload files using HTTP, copy a file, move a file, or perform TFTP actions. | 108 |
| **FTP** | Shows statistics and lets you change the current configuration for the File Transfer Protocol (FTP) server. | 77 |
| **Host** | Lets you view and change settings for a host on the network. | 70 |
| **HTTP** | Shows HyperText Transfer Protocol (HTTP) statistics and lets you change the current configuration and authentication settings. | 81 |
| **IP Address Filter** | Lets you specify all the IP addresses and subnets that are allowed to send data to this device. | 115 |
| **Line** | Shows statistics and lets you change the current configuration and Command mode settings of a serial line. | 42 |
| **LPD** | Shows LPD (Line Printer Daemon) Queue statistics and lets you configure the LPD and print a test page. | 87 |
| **Network** | Shows status and lets you configure the network interface. | 37 |
| **PPP** | Lets you configure a network link using Point-to-Point Protocol (PPP) over a serial line. | 74 |
| **Protocol Stack** | Lets you perform lower level network stack-specific activities. | 111 |
| **Query Port** | Lets you change configuration settings for the query port. | 116 |
| **RSS** | Lets you change current Really Simple Syndication (RSS) settings. | 86 |
| **SNMP** | Lets you change the current Simple Network Management Protocol (SNMP) configuration settings. | 76 |
| **SSH** | Lets you change the configuration settings for SSH server host keys, SSH server authorized users, SSH client known hosts, and SSH client users. | 91 |

*Table 6-3 Summary of Web Manager Pages (continued)*

| Web Manager Page | Description | Page |
|---|---|---|
| **SSL** | Lets you upload an existing certificate or create a new self-signed certificate. | 100 |
| **Syslog** | Lets you specify the severity of events to log and the server and ports to which the syslog should be sent. | 80 |
| **System** | Lets you reboot the EDS1100/2100, restore factory defaults, upload new firmware, and change the EDS1100/2100 long and short names. | 127 |
| **Terminal** | Lets you change current settings for a terminal. | 67 |
| **TFTP** | Shows statistics and lets you change the current configuration for the Trivial File Transfer Protocol (TFTP) server. | 78 |
| **Tunnel** | Lets you change the current configuration settings for a tunnel. | 47 |
| **VIP** | Lets you configure Virtual IP addresses to be used in Tunnel Accept Mode and Tunnel Connect Mode. | 104 |
| **XML** | Lets you export XML configuration and status records, and import XML configuration records. | 135 |

# 7: Network Settings

This chapter describes how to access, view, and configure network settings from the Network web page. The **Network** web page contains sub-menus that enable you to view and configure the aspects of your network.

This chapter contains the following sections:

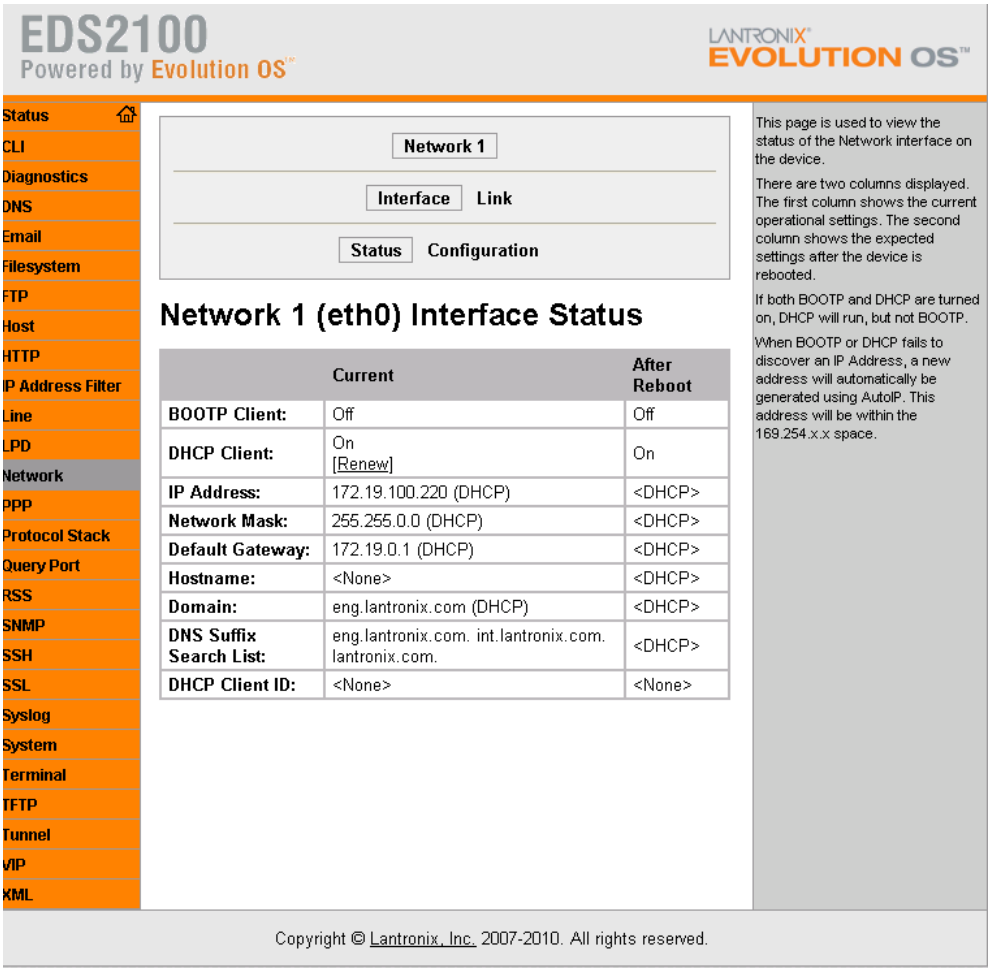

- Network 1 Interface Status
- Network 1 Interface Configuration
- Network 1 Ethernet Link


## Network 1 Interface Status

To view the Network 1 interface status, perform the following steps.

1. Click **Network** on the Main Menu. Figure 7-1 shows the page that displays.

***Figure 7-1 Network1 (eth0) Interface Status Web Page***

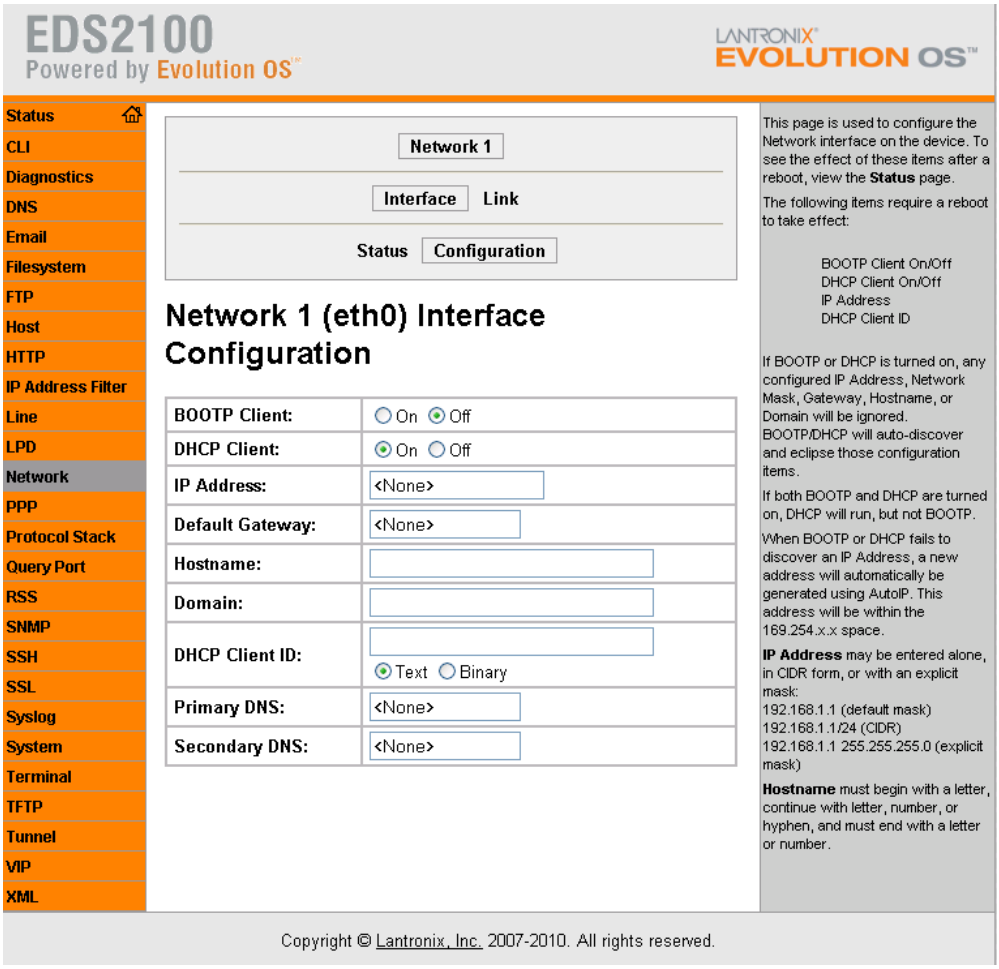


# Network 1 Interface Configuration

To configure the Network interface, perform the following steps.

1. Click **Network** on the Main Menu.
2. Click **Network 1 > Interface > Configuration**. Figure 7-2 shows the page that displays.

***Figure 7-2 Network 1 (eth0) Interface Configuration Web Page***




3. Enter or modify the fields in Table 7-3.

***Table 7-3 Network 1 Interface Configuration Fields***

| Field | Description |
|---|---|
| **BOOTP Client** | Select **On** or **Off**. At boot up the EDS1100/2100 will attempt to obtain an IP address from a BOOTP server.<br>***Notes:***<br>◆ *Overrides the configured IP address, network mask, gateway, hostname, and domain.*<br>◆ *When DHCP is **On**, the system automatically uses DHCP, regardless of whether BOOTP Client is **On.*** |

*Table 7-3 Network 1 Interface Configuration Fields (continued)*

| Field | Description |
|---|---|
| **DHCP Client** | Select **On** or **Off**. At boot up the EDS1100/2100 will attempt to lease an IP address from a DHCP server and maintain the lease at regular intervals.<br>***Note:*** *Overrides BOOTP, the configured IP address, network mask, gateway, hostname, and domain.* |
| **IP Address** | Enter the EDS1100/2100 static IP address. You may enter it alone, in CIDR format, or with an explicit mask. The IP address is used if BOOTP and DHCP are both set to **Off**. Changing this value requires you to reboot the EDS1100/2100.<br>***Note:*** *When DHCP is enabled, the EDS1100/2100 tries to obtain an IP address from DHCP. If it cannot, AutoIP, a server-less method of selecting the IP address when the DHCP server is unavailable, assigns an address in the range of 169.254.xxx.xxx.* |
| **Default Gateway** | Enter the IP address of the router for this network. Or clear the field (appears as <None>). This address is only used for static IP address configuration. |
| **Hostname** | Enter the EDS1100/2100 hostname. It must begin with a letter, continue with a sequence of letters, numbers, and/or hyphens, and end with a letter or number. |
| **Domain** | Enter the domain name. |
| **DHCP Client ID** | Enter the ID if the DHCP server uses a DHCP ID. The DHCP server lease table shows IP addresses and MAC addresses for devices. The lease table shows the Client ID, in hexadecimal notation, instead of the EDS1100/2100 MAC address. |
| **Primary DNS** | IP address of the primary name server. This entry is required if you choose to configure a DNS (Domain Name Server). |
| **Secondary DNS** | IP address of the secondary DNS. |

4. Click **Submit**. Changes to the following settings require a reboot for the changes to take effect:
   - BOOTP Client
   - DHCP Client
   - IP address
   - DHCP Client ID

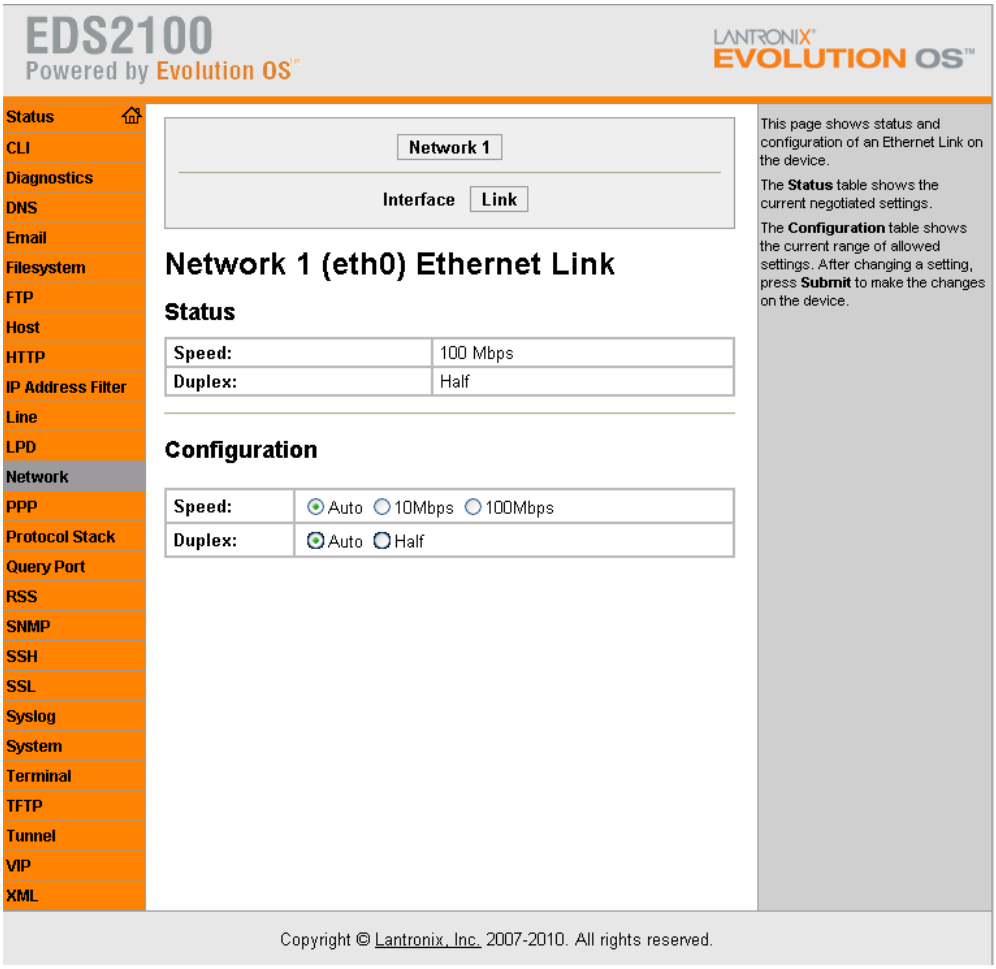
## Network 1 Ethernet Link

To display and change settings in the Network 1 Ethernet Link web page, perform the following steps.

1. Click **Network** on the Main Menu.

2. Click **Network 1 > Link**. Figure 7-4 shows the page that displays.

***Figure 7-4 Network1 (eth0) Ethernet Link Web Page***




3. Enter or modify the fields in Table 7-5.

***Table 7-5 Network 1 (eth0) Ethernet Link Fields***

| Field | Description |
|---|---|
| **Speed** | Select the Ethernet link speed. Auto is the default. |
| **Duplex** | Select the Ethernet link duplex mode. Auto is the default. |

4. Click **Submit**.

# 8: Line and Tunnel Settings

This chapter describes how to view and configure lines and tunnels. It contains the following sections:


- Line Settings
- Tunnel Settings


## Line Settings

You can view statistics and configure the serial interfaces (referred to as lines) by using the **Line** web page. When you click **Line** from the Main Menu, **Line 1** fields display. To go to **Line 2**, click the **Line 2** button.

The following sub-menus you can use:

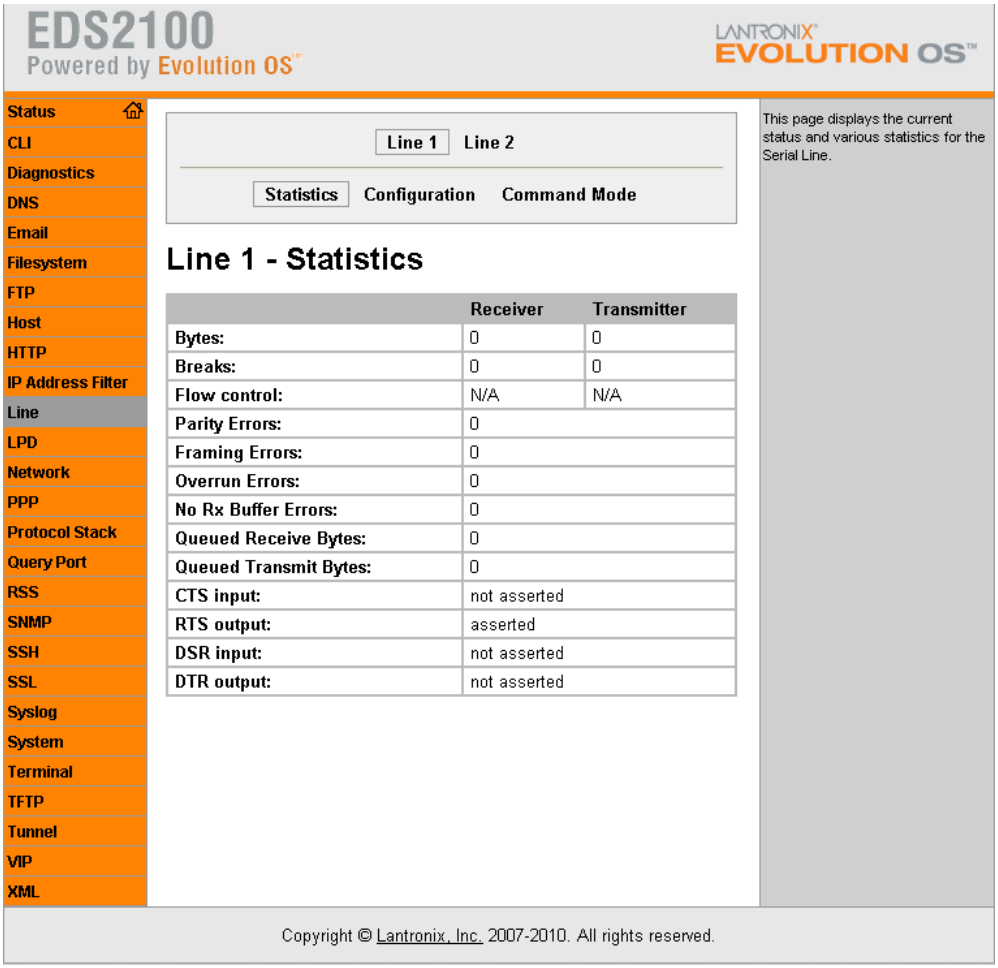
- **Line Statistics**—Displays statistics for the two lines. For example, the bytes received and transmitted, breaks, flow control, parity errors, etc.
- **Line Configuration**—Enables the change of the name, interface, protocol, baud rates, and parity, etc.
- **Line Command Mode**—Enables the types of modes, wait time, serial strings, signon message, etc.

### Line Statistics

To display the line statistics, perform the following steps.

1. Click **Line** on the Main Menu. Figure 8-1 shows the page that displays.

*Figure 8-1 Line 1 Statistics Web Page*

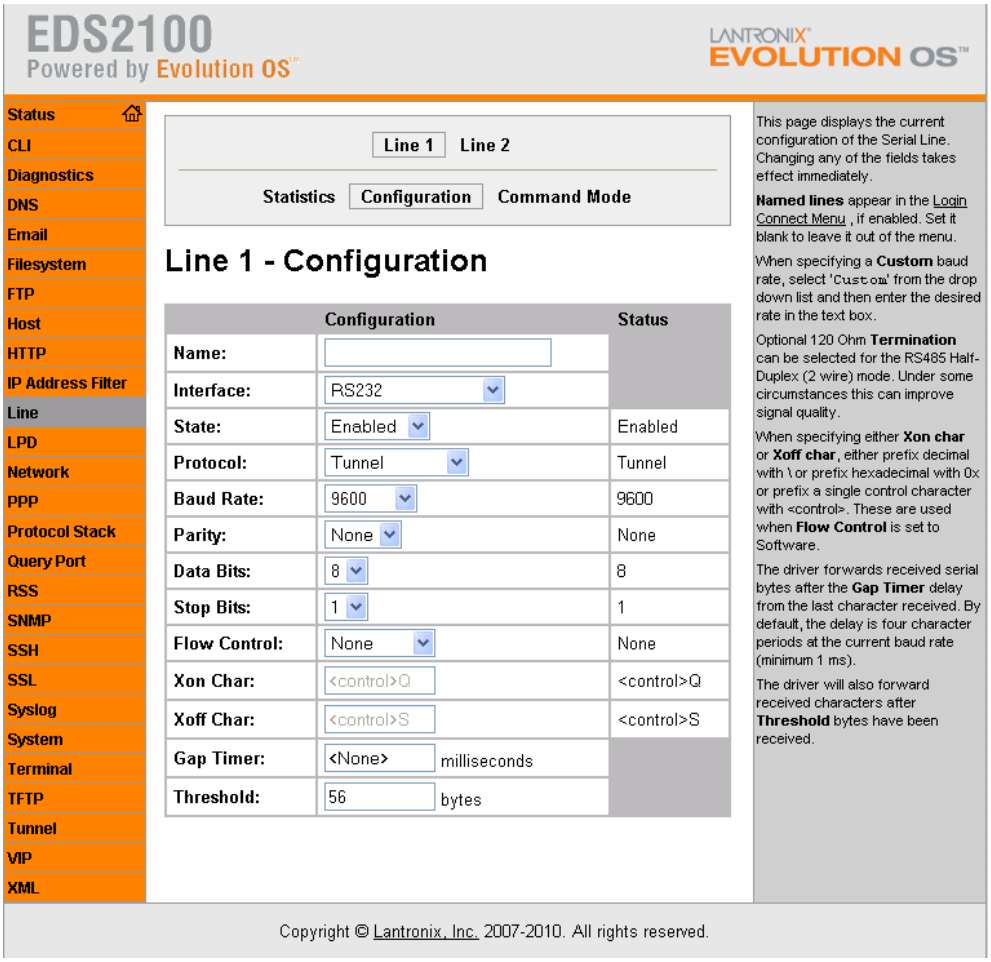



## Line Configuration

To configure a line, perform the following steps.

1. Click **Line** > **Line 1 > Configuration**. **Line 2** has the same fields as Line 1. Figure 8-2 shows the page that displays.

*Figure 8-2 Line 1 Configuration Web Page*




2. Enter or modify the fields in Table 8-3.

*Table 8-3 Line 1 Configuration Fields*

| Field | Description |
|---|---|
| **Name** | Enter a name for the line. |
| **Interface** | Select the interface type from the drop-down menu. The default is RS232. |
| **State** | Indicates whether the current line is enabled. To change the status, select Enabled or Disabled from the drop-down menu. |
| **Protocol** | Select the protocol from the drop-down menu. The default is Tunnel.<br>***Note:*** *All protocols work in **Connect** and **Accept Mode** except the LPD or Tunnel protocol option which is supported only in **Accept Mode**.* |
| **Baud Rate** | Select the baud rate from the drop-down menu. The default is 9600. |
| **Parity** | Select the parity from the drop-down menu. The default is None. |
| **Data Bits** | Select the number of data bits from the drop-down menu. The default is 8. |
| **Stop Bits** | Select the number of stop bits from the drop-down menu. The default is 1. |

*Table 8-3 Line 1 Configuration Fields (continued)*

| Field | Description |
|---|---|
| **Flow Control** | Select the flow control from the drop-down menu. The default is None. |
| **Xon Char** | Specify the character to use to start the flow of data when Flow Control is set to Software. Prefix a decimal character with \ or a hexadecimal character with 0x, or provide a single printable character. The default Xon char is 0x11. |
| **Xoff Char** | Specify the character to use to stop the flow of data when Flow Control is set to Software. Prefix a decimal character with \ or a hexadecimal character with 0x, or provide a single printable character. The default Xoff char is 0x13. |
| **Gap Timer** | The driver forwards received serial bytes after the **Gap Timer** delay from the last character received. By default, the delay is four character periods at the current baud rate (minimum 1 ms). |
| **Threshold** | The driver will also forward received characters after **Threshold** bytes have been received. |

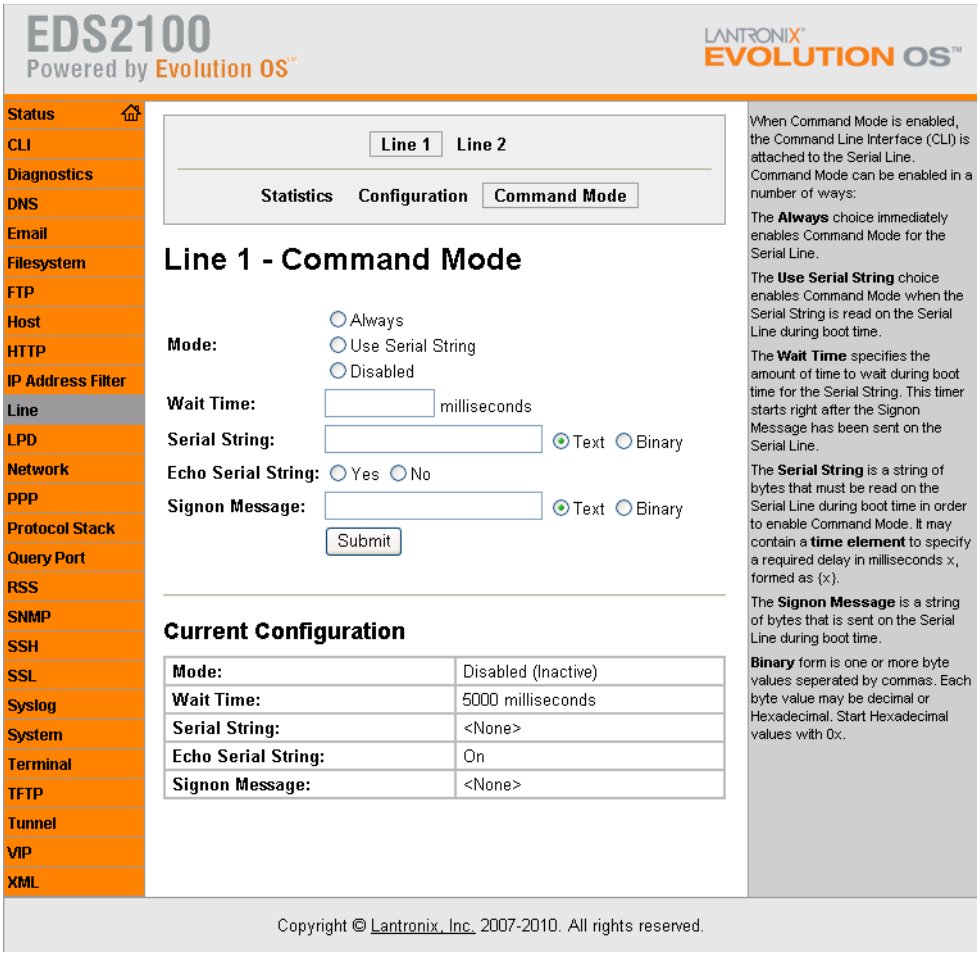
3. Click **Submit**.

## Line Command Mode

To configure the Command Mode, perform the following steps.

1. Click **Line > Line 1 > Command Mode.** Figure 8-4 shows the page that displays.

*Figure 8-4 Line 1 Command Mode Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Line 1
Line 2
Statistics
Configuration
Command Mode
Line 1 - Command Mode
Mode:
Always
Use Serial String
Disabled
Wait Time:
milliseconds
Serial String:
Text
Binary
Echo Serial String:
Yes
No
Signon Message:
Text
Binary
Submit
Current Configuration
Mode: Disabled (Inactive)
Wait Time: 5000 milliseconds
Serial String: <None>
Echo Serial String: On
Signon Message: <None>
When Command Mode is enabled, the Command Line Interface (CLI) is attached to the Serial Line. Command Mode can be enabled in a number of ways:
The Always choice immediately enables Command Mode for the Serial Line.
The Use Serial String choice enables Command Mode when the Serial String is read on the Serial Line during boot time.
The Wait Time specifies the amount of time to wait during boot time for the Serial String. This timer starts right after the Signon Message has been sent on the Serial Line.
The Serial String is a string of bytes that must be read on the Serial Line during boot time in order to enable Command Mode. It may contain a time element to specify a required delay in milliseconds x, formed as {x}.
The Signon Message is a string of bytes that is sent on the Serial Line during boot time.
Binary form is one or more byte values seperated by commas. Each byte value may be decimal or Hexadecimal. Start Hexadecimal values with 0x.
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2. Enter or modify the fields in Table 8-5.

*Table 8-5 Line 1 Command Mode Fields*

| Field | Description |
|---|---|
| **Mode** | Select the method of enabling Command Mode or choose to disable Command Mode.<br>◆ **Always**—Immediately enables Command Mode for the serial line.<br>◆ **Use Serial String**—Enables Command Mode when the serial string is read on the serial line during boot time.<br>◆ **Disabled**—Turns off Command Mode. |
| **Wait Time** | Enter the wait time for the serial string during boot-up in milliseconds. |
| **Serial String** | Enter the serial string characters. Select a string type.<br>◆ **Text**—String of bytes that must be read on the Serial Line during boot time to enable Command Mode. It may contain a time element in x milliseconds, in the format {x}, to specify a required delay.<br>◆ **Binary**—String of characters representing byte values where each hexadecimal byte value starts with \0x and each decimal byte value starts with backslash (\). |

*Table 8-5 Line 1 Command Mode Fields (continued)*

| Field | Description |
|---|---|
| **Echo Serial String** | Select Yes to enable echoing of the serial string at boot-up. |
| **Signon Message** | Enter the boot-up signon message. Select a string type.<br>◆ **Text**—String of bytes sent on the serial line during boot time.<br>◆ **Binary**—One or more byte values separated by commas. Each byte value may be decimal or hexadecimal. Start hexadecimal values with 0x.<br>***Note:*** *This string gets output on the serial port at boot, regardless of whether command mode is enabled or not.* |

3. Click **Submit**.

# Tunnel Settings

Tunneling allows serial devices to communicate over a network, without “being aware” of the devices which establish the network connection between them. When any character is transmitted to the serial port, it gets copied to the network connection.

Tunneling parameters are configured using the Web Manager (see Tunnel Settings on page 46) or CLI Tunnel Menu (refer to the *EDS1100/2100 Command Reference)* for the full list of commands.)

The EDS1100/2100 supports two connections simultaneously per serial port. One of the connections is Connect Mode and the other connection is Accept Mode. The connections on one serial port are separate from those on the other serial port.

- Connect Mode—Makes an active connection. The receiving node on the network must listen for the Connect Mode connection. Connect Mode is disabled by default.
- Accept Mode—Listens for a connection. A node on the network initiates the connection. Accept Mode is enabled by default.
- Disconnect Mode—Defines how an open connection stops the forwarding of data. The specific parameters to stop the connection are configurable. Once a defined event occurs, the EDS1100/2100 disconnects Accept Mode and Connect Mode connections on that port.

You can view statistics and configure two tunnels by using the **Tunnel** web page. When you click **Tunnel** from the Main Menu, Tunnel 1 fields display. To go to Tunnel 2, click the Tunnel 2 button. There are six sub-menus that you can use as follows:

- **Statistics**—Displays statistics for the two lines. For example, completed accepts, completed connects, disconnects, dropped accepts, dropped connects, etc.
- **Serial Settings**—Configures buffer size and DTR.
- **Connect Mode**—Controls how a tunnel behaves when a connection attempt originates locally.
- **Accept Mode**—Controls how a tunnel behaves when a connection attempt originates from the network.
- **Disconnect Mode**—Relates to the disconnect of a tunnel.
- **Packing Mode**—Sends packed data that is queued in larger chunks instead of sending it immediately after being read on the serial line.
- **Modem Emulation**—Initiates and accepts tunnel connections using the AT commands.

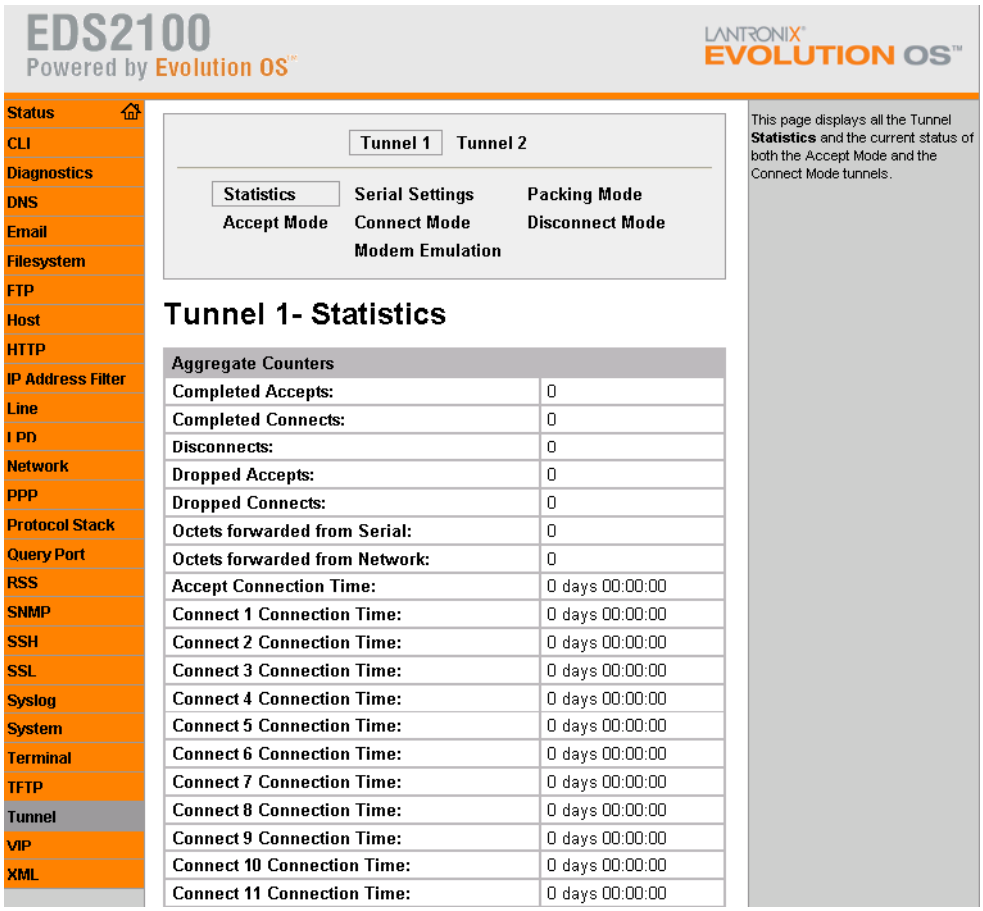
## Tunnel Statistics

The EDS1100/2100 logs tunneling statistics. The **Dropped** statistic shows connections ended by the remote location. The **Disconnects** statistic shows connections ended by the EDS1100/2100.

To display the tunnel statistics, perform the following steps.

1. Click **Tunnel** on the **Main Menu**. Figure 8-6 shows the page that displays.

***Figure 8-6 Tunnel 1 Statistics Web Page***




## Serial Settings

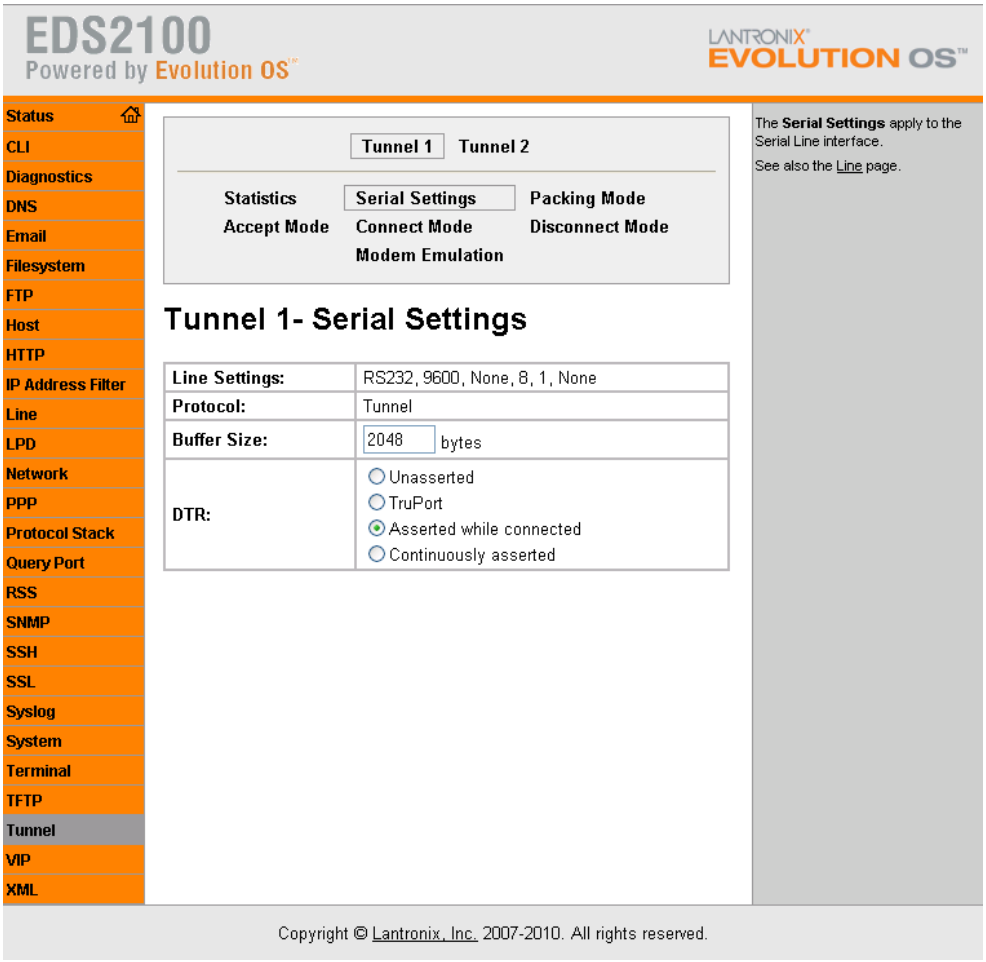
Serial line settings are configurable for both serial line 1 and serial line 2. Configure the buffer size to change the maximum amount of data the serial port stores. For any active connection, the EDS1100/2100 sends the data in the buffer.

The modem control signal DTR on the Line may be continually asserted or asserted only while either an Accept Mode tunnel or a Connect Mode tunnel is connected.

To configure the serial settings, perform the following steps.

1. Click **Tunnel > Tunnel 1 > Serial Settings**. Figure 8-7 shows the page that displays.

*Figure 8-7 Tunnel 1 Serial Settings Web Page*




2. View or modify the fields in Table 8-8.

*Table 8-8 Tunnel 1 Serial Settings Fields*

| Fields | Description |
|---|---|
| **Line Settings** | Display only field. Current serial settings for the line. |
| **Protocol** | Display only field. The protocol being used for the tunnel. |
| **Buffer Size** | Enter the buffer size used for the tunneling of serial data received. Requires reboot to take effect. |
| **DTR** | Select when to assert DTR.<br>◆ **Unasserted**<br>◆ **TruPort**—Asserted whenever a connect mode or an accept mode tunnel connection is active with the Telnet Protocol RFC2217. The remote DSR is asserted.<br>◆ **Asserted while connected**—Asserted whenever a connect or an accept mode tunnel connection is active.<br>◆ **Continuously asserted**—Asserted regardless of the status of a tunnel connection. |

3. Click **Submit.**

## Packing Mode

Packing Mode takes data from the serial port, packs it together, and sends over the network. Packing can be configured based on threshold (size in bytes) or timeout (milliseconds).

Size is set by modifying the threshold field. When the number of bytes exceeds the threshold, a packet is sent.

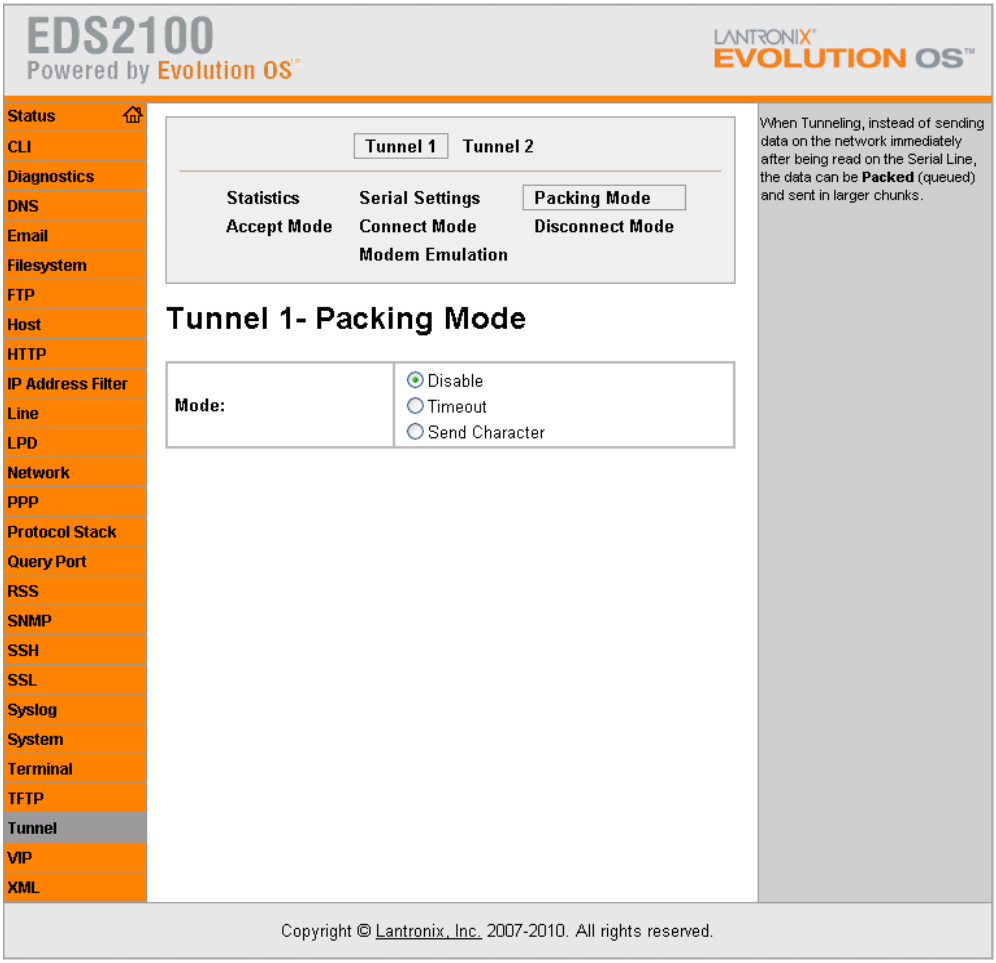
The timeout field is used to force a packet to be sent after a maximum time. The packet is sent even if the threshold maximum is not reached.

When Send Character is configured, there is an optional trailing character parameter which can be specified. It can be a single printable character or a control character.

To configure the tunnel packing mode, perform the following steps.

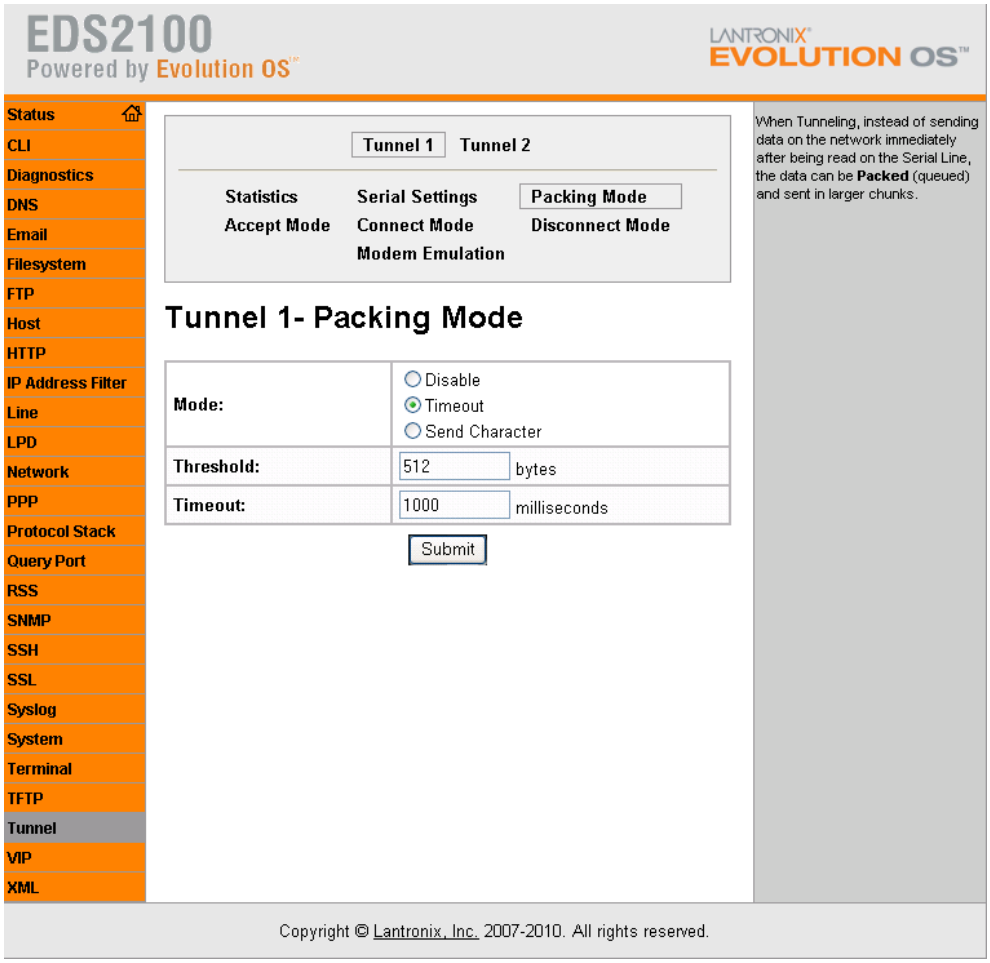
1. Click **Tunnel > Tunnel 1 > Packing Mode**. Figure 8-12 shows the page that displays.

***Figure 8-9 Tunnel 1 Packing Mode Web Page***




2. Click **Timeout**. Figure 8-12 shows the page that displays.

*Figure 8-10 Tunnel 1 Packing Mode (Timeout)*



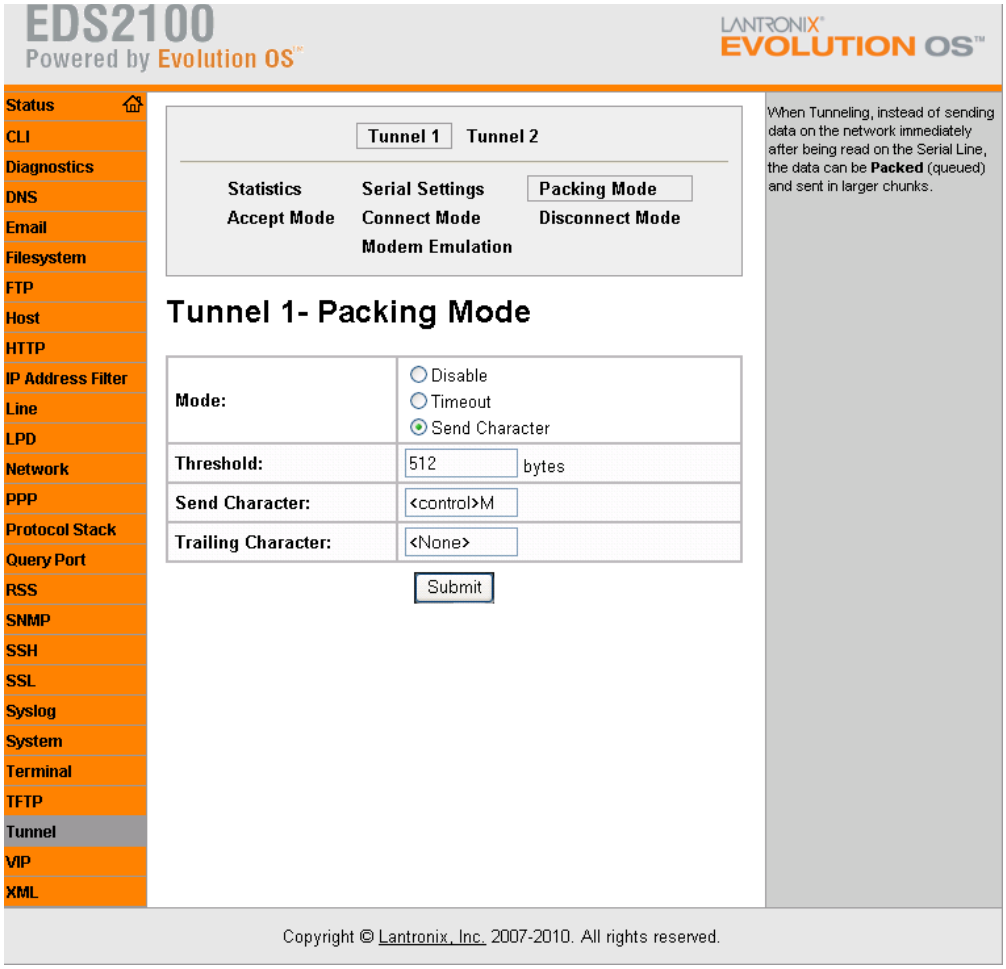

3. Enter or modify the fields in Table 8-11.

*Table 8-11 Tunnel Packing Mode (Timeout) Fields*

| Field | Description |
|---|---|
| **Threshold** | Send the queued data when the number of queued bytes reaches the threshold. |
| **Timeout** | Enter a time, in milliseconds, for the EDS1100/2100 to send the queued data after the first character was received. |

4. Click **Submit.**
5. Click **Send Character**. Figure 8-12 shows the page that displays.

*Figure 8-12 Tunnel 1 Packing Mode (Send Character)*




6. Enter or modify the fields in Table 8-13.

*Table 8-13 Tunnel Packing Mode (Send Character) Fields*

| Field | Description |
|---|---|
| **Threshold** | Send the queued data when the number of queued bytes reaches the threshold. |
| **Send Character** | Enter the send character. Upon receiving this character, the EDS1100/2100 sends out the queued data. |
| **Trailing Character** | Enter the trailing character. This character is sent immediately following the send character. |

7. Click **Submit.**

## Accept Mode

In Accept Mode, the EDS1100/2100 waits for a connection from the network. The configurable local port is the port the remote device connects to for this connection. There is no remote port or address. The default local port is 10001 for serial port 1 and 10002 for serial port 2.

Accept Mode supports the following protocols:

- SSH (EDS1100/2100 acts as the server). When using SSH, the SSH server host keys and at least one SSH authorized user must be configured.
- SSL
- TCP
- AES encryption over TCP
- Telnet (EDS1100/2100 supports IAC codes. It drops the IAC codes when Telnetting and does not forward them to the serial port).

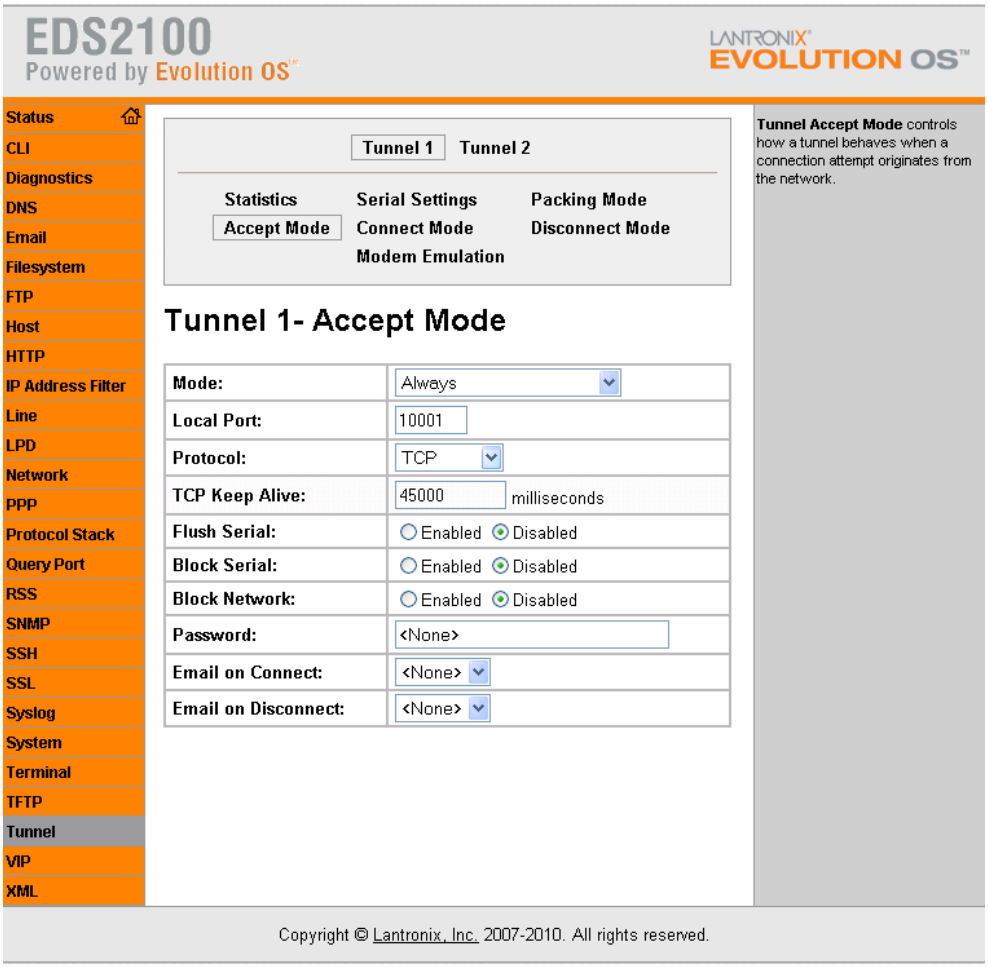
Accept Mode has the following states:

- Disabled (never a connection)
- Enabled (always listening for a connection)
- Active if it receives any character from the serial port
- Active if it receives a specific (configurable) character from the serial port (same start character as Connect Mode's start character)
- Modem control signal
- Modem emulation

To configure Accept Mode, perform the following steps.

1. Click **Tunnel 1 > Accept Mode**. Figure 8-14 shows the page displays.

*Figure 8-14 Tunnel 1 Accept Mode Web Page*




2. Enter or modify the fields in Table 8-15.

*Table 8-15 Tunnel Accept Mode Fields*

| Field | Description |
|---|---|
| **Mode** | Select the method used to start a tunnel in Accept mode. Choices are:<br>◆ **Disabled**—Do not accept an incoming connection.<br>◆ **Always**—Accept an incoming connection. (*default*)<br>◆ **Any Character**—Start waiting for an incoming connection when any character is read on the serial line.<br>◆ **Start Character**—Start waiting for an incoming connection when the start character for the selected tunnel is read on the serial line.<br>◆ **Modem Control Asserted**—Start waiting for an incoming connection as long as the Modem Control pin (DSR) is asserted on the serial line until a connection is made.<br>◆ **Modem Emulation**—Start waiting for an incoming connection when triggered by modem emulation AT commands. Connect mode must also be set to Modem Emulation. |

*Table 8-15 Tunnel Accept Mode Fields (continued)*

| Field | Description |
|---|---|
| **Local Port** | Enter the port number for use as the local port. The defaults are port 10001 for Tunnel 1 and port 10002 for Tunnel 2. |
| **Protocol** | Select the protocol type for use with Accept Mode. The default protocol is TCP. If you select TCP AES you will need to configure the AES keys. |
| **TCP Keep Alive** | Enter the time, in seconds, the EDS1100/2100 waits during a silent connection before checking if the currently connected network device is still on the network. If the unit then gets no response after 8 attempts, it drops that connection. |
| **Flush Serial Data** | Select Enabled to flush the serial data buffer on a new connection. |
| **Block Serial Data** | Select On to block, or not tunnel, serial data transmitted to the EDS1100/2100. |
| **Block Network Data** | Select On to block, or not tunnel, network data transmitted to the EDS1100/2100. |
| **Password** | Enter a password that clients must send to the EDS1100/2100 within 30 seconds from opening a network connection to enable data transmission.<br>The password can have up to 31 characters and must contain only alphanumeric characters and punctuation. When set, the password sent to the EDS1100/2100 must be terminated with one of the following: (a) 0x0A (LF), (b) 0x00, (c) 0x0D 0x0A (CR LF), or (d) 0x0D 0x00. |
| **Email on Connect** | Select whether the EDS1100/2100 sends an email when a connection is made. Select None if you do not want to send an email. Otherwise, select the Email profile to use for sending. |
| **Email on Disconnect** | Select whether the EDS1100/2100 sends an email when a connection is closed. Select None if you do not want to send an email. Otherwise, select the Email profile to use for sending. |
| **CP Output** | Identifies a CP or CP Group whose value should change when a connection is established and dropped. |

3. Click **Submit.**

## Connect Mode

Connect Mode defines how the EDS1100/2100 makes an outgoing connection. For Connect Mode to function, it must be enabled, have a remote station configured, and a remote port configured (TCP or UDP). When enabled, Connect Mode is always on.

Enter the remote station as an IP address or DNS name. The EDS will not make a connection unless it can resolve the address. For DNS names, after 4 hours of an active connection, the EDS will re-evaluate the address. If it is a different address, it will close the connection.

Connect Mode supports the following protocols:

- TCP
- AES encryption over TCP and UDP
- SSH (the EDS1100/2100 is the SSH client)
- SSL

- UDP (available only in Connect Mode because it is a connectionless protocol).
- Telnet

***Note:*** *The Local Port in Connect Mode is independent of the port configured in Accept Mode.*

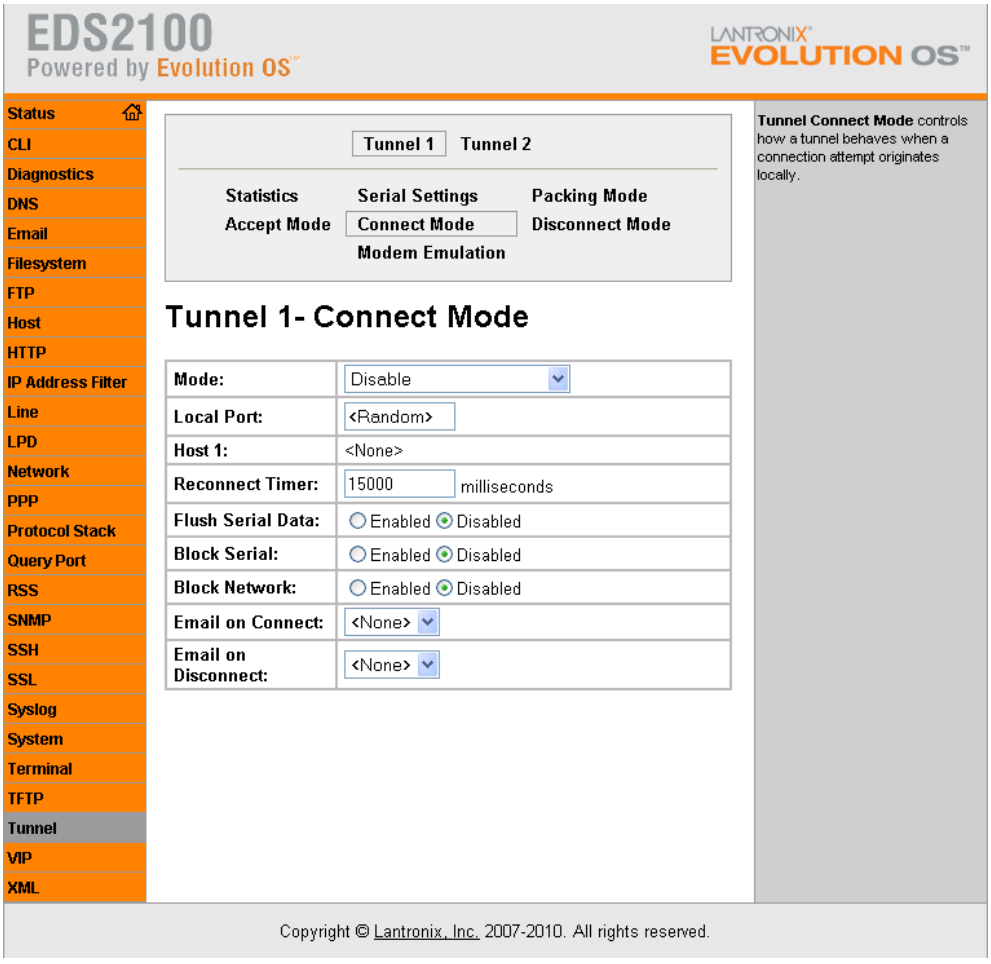
Connect Mode has six modes used to initiate and maintain a connection:

- Disabled (no connection)
- Enabled (always makes a connection)
- Active if it sees any character from the serial port
- Active if it sees a specific (configurable) character from the serial port
- Modem control signal
- Modem emulation

To configure Tunnel 1 Connect Mode, perform the following steps.

1. Select **Tunnel 1 > Connect Mode**. Figure 8-16 shows the page that displays.

***Figure 8-16 Tunnel Connect Mode Page***



2. Enter or modify the fields in Table 8-17.

***Table 8-17 Tunnel Connect Mode Fields***

| Field | Description |
|---|---|
| **Mode** | Select the method to be used to attempt a connection to a remote host or device. Choices are:<br>◆ **Always**—A connection is attempted until one is made. If the connection gets disconnected, the EDS1100/2100 retries until it makes a connection. (default)<br>◆ **Disable**—An outgoing connection is never attempted.<br>◆ **Any Character**—A connection is attempted when any character is read on the serial line.<br>◆ **Start Character**—A connection is attempted when the start character for the selected tunnel is read on the serial line.<br>◆ **Modem Control Asserted**—A connection is attempted as long as the Modem Control (DSR) is asserted, until a connection is made. Configure the Modem Control Asserted setting (for DSR or DTR) to start a connection when the signal is asserted. The EDS1100/2100 will try to make a connection indefinitely. If the connection closes, it will not make another connection unless the signal is asserted again.<br>◆ **Modem Emulation**—A connection is attempted when triggered by modem emulation AT commands.<br>***Note:*** *For the "any character" or "specific character" modes, the EDS1100/2100 waits and retries the connection. Once it makes a connection and disconnects, it cannot reconnect until it sees "any character" or the "start character" again (depending on the configured setting).* |
| **Local Port** | Enter the port for use as the local port. A random port is selected by default. Once you have configured a number, click the Random link in the Current Configuration to switch back to random. |

*Table 8-17 Tunnel Connect Mode Fields (continued)*

| Field | Description |
|---|---|
| **Host** | Click **<None>** in the Host field to configure the Host parameters and enter the following fields:<br>◆ **VIP**—Enabling the VIP directs the tunnel to connect to a remote Lantronix Virtual IP identified by the **VIP Name**. When VIP is enabled, the Host 2 field displays. See 12: VIP for more information. Default is Disabled.<br>***Note:*** *The EDS1100/2100 supports configuration of up to sixteen hosts.*<br>◆ **VIP Name**—Displays configured VIP name, used only if **VIP** is enabled.<br>◆ **Port**—Displays configured Port.<br>◆ **Protocol**—Select the protocol type (SSH, SSL, TCP, TCP AES, Telnet, UDP, and UDP AES) for use with Connect Mode. The default protocol is TCP. The following are enabled for SSH, TCP, TCP AES, and UDP AES:<br>- **SSH Username**—Displays configured username, used only if SSH protocol is selected. This is required. The EDS1100/2100 is the client and the SSH client username must be configured on the remote SSH server before using the EDS1100/2100.<br>- **TCP Keep Alive**—Sends probes to the other end of the connection to ensure that the connection is still valid. Default is 45000 milliseconds.<br>- **AES Encrypt/Decrypt Key**—Displays presence of key, used only if protocol with AES is selected. When setting AES encryption, both the encrypt key and the decrypt key must be specified. The encrypt key is used for data sent out. The decrypt key is used for receiving data. Both of the keys may be set to the same value.<br>***Note:*** *For UDP, the EDS1100/2100 accepts packets from any device on the network. It send packets to the last device that sent it packets.* |

*Table 8-17 Tunnel Connect Mode Fields (continued)*

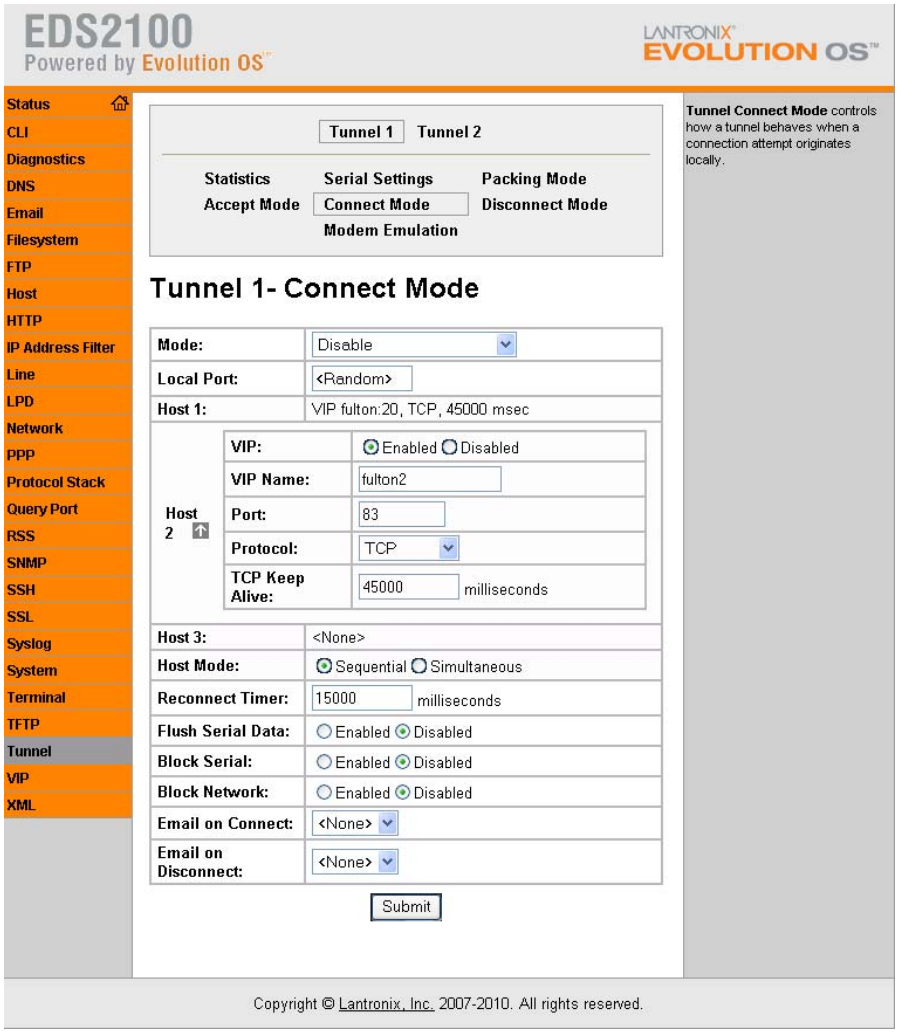
| Field | Description |
|---|---|
| **Reconnect Timer** | Enter the reconnect time in milliseconds. The EDS1100/2100 attempts to reconnect after the specified amount of time when a connection fails or when exiting an established connection. This behavior depends upon the Disconnect Mode.<br>***Notes:***<br>◆ *When you configure **Tunnel - Connect Mode**, you can specify a number of milliseconds to attempt to reconnect after a dropped connection has occurred. The default is 1500 milliseconds.*<br>◆ *The Reconnect Timer only applies if a **Disconnect Mode** is configured. With a **Disconnect Mode** set, the device server maintains a connection until the disconnect mode condition is met (at which time the device server closes the connection). If the tunnel is dropped due to conditions beyond the device server, the device server attempts to re-establish a failed connection when the specified reconnect interval reaches its limit.*<br>◆ *Any network-side disconnect is considered an error and a reconnect is attempted without regard to the **Connect Mode** settings. Simultaneous **Connect Mode** connections require some **Disconnect Mode** configurations or the connections will never terminate. See* Disconnect Mode on page 61 *for more information about the parameters.*<br>◆ *If **Disconnect Mode** is disabled and the network connection is dropped, then the re-establishment of a tunnel connection is governed by the configured **Connect Mode** settings.* |
| **Flush Serial Data** | Select whether to flush the serial line when a connection is made. Choices are:<br>◆ **Enabled**—Flush the serial line when a connection is made.<br>◆ **Disabled**—Do not flush the serial line. This is the default. |
| **Block Serial Data** | Select On to block (not tunnel) serial data transmitted to the EDS1100/2100. |
| **Block Network Data** | Select On to block (not tunnel) network data transmitted to the EDS1100/2100. |
| **Email on Connect** | Select whether the EDS1100/2100 sends an email when a connection is made. Select None if you do not want to send an email. Otherwise, select the Email profile to use. |
| **Email on Disconnect** | Select whether the EDS1100/2100 sends an email when a connection is closed. Select None if you do not want to send an email. Otherwise, select the Email profile to use. |
| **CP Output** | Identifies a CP or CP Group whose value should change when a connection is established and when it is dropped. |

3. Click **Submit**.

## Multiple Hosts

When you configure two or more hosts in the **Tunnel** web page, **Host Mode** displays as shown in Figure 8-18.

***Figure 8-18 Host Mode***



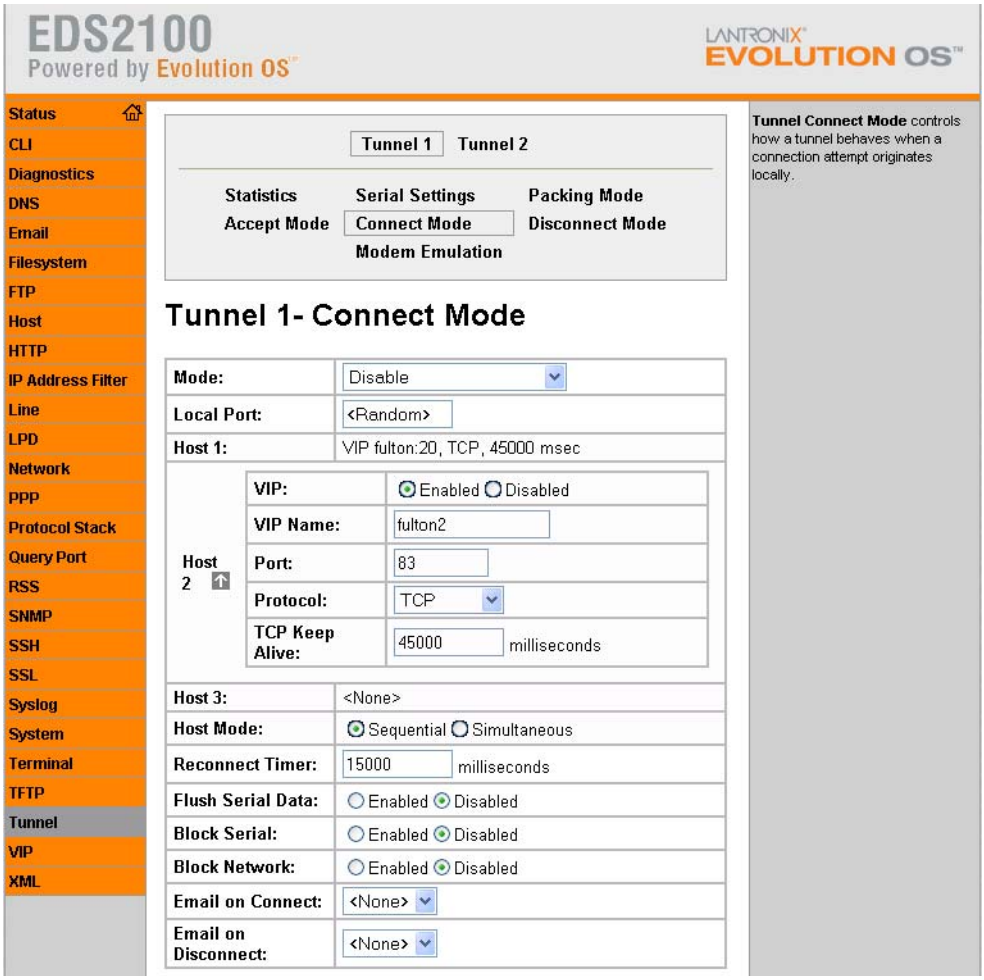

Host Mode controls how multiple hosts operate in Connect Mode. The following options are available:

- Sequential—A Tunnel to the first host is attempted. If the connection fails, the next host specified is attempted. This will continue until a connection is made. If a connection is dropped after a successful connection has been established, tunnel connection attempts begin again from the first host.This is the default.
- Simultaneous—Tunnel connects to all of the hosts that accept a connection.

To configure Host 2 and other hosts up to a maximum of 16, perform the following steps.

1. Click **<None>** in the Host 2 field. Figure 8-19 shows the page that displays.

*Figure 8-19 Host 2 Configuration Fields*




2. Enable **VIP** by clicking **Enabled**. The default is disabled.
3. Enter a **VIP Name**.

***Note:*** *See 12: VIP for more information about specifying VIP names.*

4. Enter the **Port** number.
5. Select the **Protocol** from the pull-down menu. Depending upon the specified protocol, other options are as follows:
   - For TCP and Telnet, input the keep alive milliseconds.
   - For SSH, input the SSH username.
   - For TCP AES and UDP AES, input the Encrypt/Decrypt keys.

     ***Note:*** SSL and UDP do not have other options.
6. Repeat the steps until all of your hosts get configured. The maximum is 16.
7. Click **Submit**.

## Host List Promotion

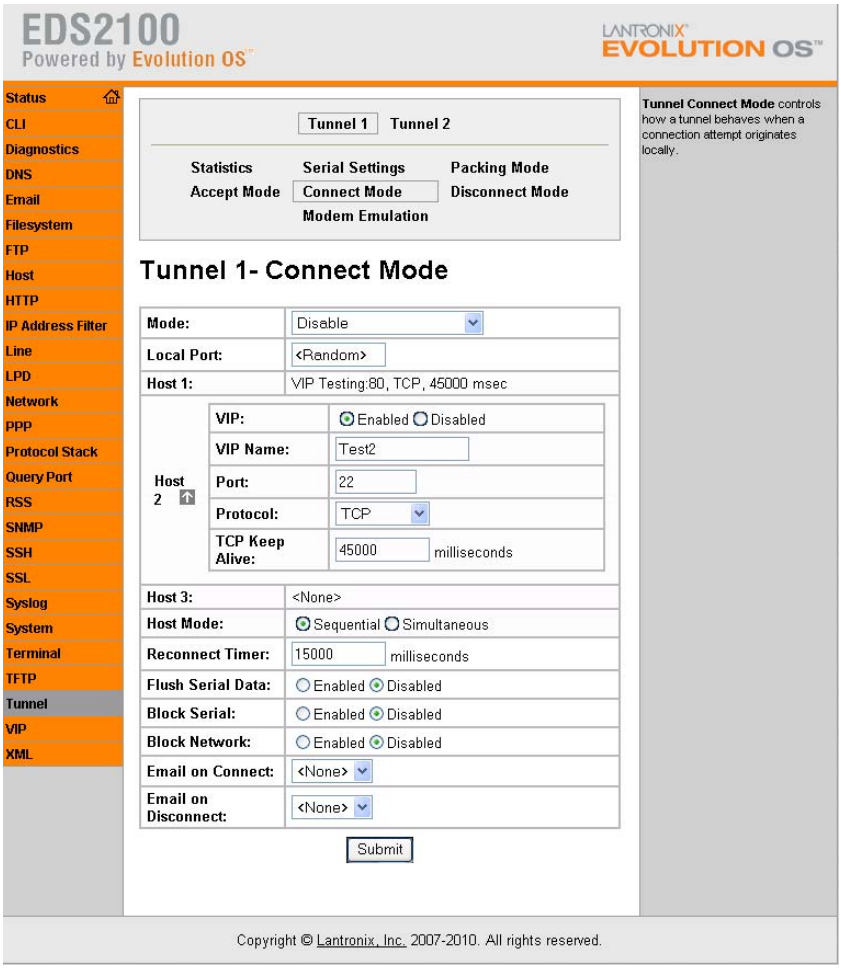
The EDS1100/2100 allows the host list connection order to be specified. There are two types of host modes: Sequential and Simultaneous. Simultaneous connections occur approximately at the same time to all listed hosts.

Sequential host lists establish a prioritized list of tunnels. The host specified as Host 1 will be attempted first. If that fails, it will proceed to Host 2, 3, etc, in the order they are specified. When a connection drops, the cycle starts again with Host 1 and proceeds in order. Establishing the host order is accomplished with host list promotion.

To promote hosts, perform the following steps.

1. Click the arrow icon ( ) of the host you want to promote as shown in Figure 8-20.

***Figure 8-20 Host List Promotion***




2. Click **Submit**. The hosts change sequence.

## Disconnect Mode

Disconnect Mode ends Accept Mode and Connect Mode connections. It runs in the background of an active connection to determine when to disconnect. When disconnecting, the EDS1100/2100 shuts down connections gracefully. The following settings end a connection:

- Stop character received.

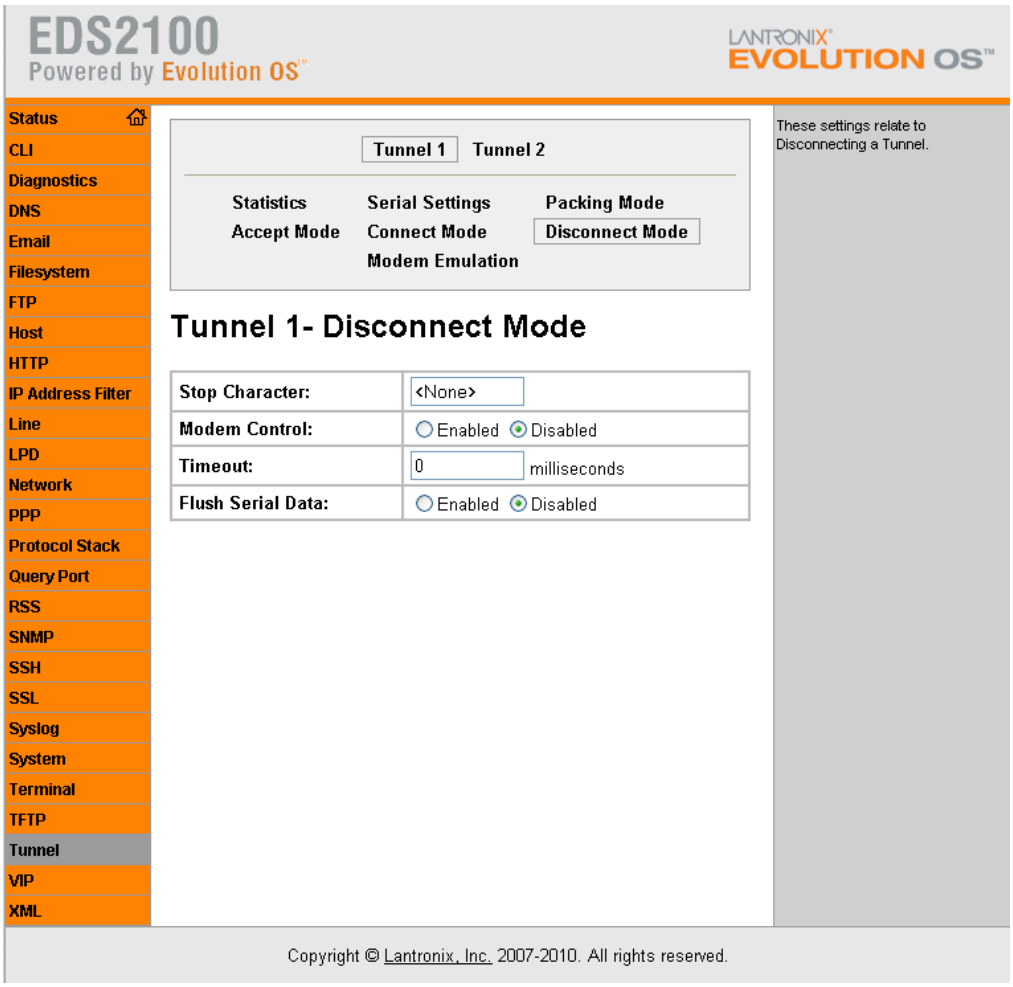
- Timeout period elapsed and no activity. Both Accept Mode and Connect Mode must be idle for a specified time frame.
- Modem control inactive setting.

***Note:*** *To clear data out of the serial buffers upon a disconnect, enable "Flush Serial Data".*

To configure Disconnect Mode, perform the following steps.

1. Click **Tunnel 1 > Disconnect Mode**. Figure 8-21 shows the page that displays.

***Figure 8-21 Tunnel 1 Disconnect Mode Web Page***




2. Enter or modify the fields in Table 8-22.

***Table 8-22 Tunnel Disconnect Mode Fields***

| Field | Description |
|---|---|
| **Stop Character** | Enter the stop character in ASCII, hexadecimal, or decimal notation. Select **<None>** to disable. |
| **Modem Control** | Select **Enabled** to disconnect when the modem control pin is not asserted on the serial line. |

*Table 8-22 Tunnel Disconnect Mode Fields (continued)*

| Field | Description |
|---|---|
| **Timeout** | Enter a time, in milliseconds, for the EDS1100/2100 to disconnect on a timeout. The value 0 (zero) disables the idle timeout. |
| **Flush Serial Data** | Select **Enabled** to flush the serial data buffer on a disconnection. |

3. Click **Submit**.

## Modem Emulation

The EDS1100/2100 supports Modem Emulation mode for devices that send out modem signals. There are two different modes supported:

- Command Mode—Sends verbal response codes.
- Data Mode—Information transferred in gets transferred out.

It is possible to change the default settings for verbose response codes, echo commands, and quiet mode, by using Command Mode commands. The current settings can be overridden; however on reboot, the settings return to the programmed settings.

Configure the connect string as required. The connect string appends to the communication packet when the modem connects to a remote location. It is possible to append additional text to the connect message.

### Command Mode

The Modem Emulation Command Mode supports the standard AT command set. For a list of available commands from the serial or Telnet login, enter **AT?**. Use ATDT, ATD, and ATDP to establish a connection. All of these commands behave like a modem. For commands that are valid but not applicable to the EDS1100/2100, an “OK” message is sent (but the command is silently ignored).

The EDS1100/2100 attempts to make a Command Mode connection as per the IP/DNS/port numbers defined in Connect Mode. It is possible to override the remote address, as well as the remote port number.

Table 8-1 lists and describes the available commands.

*Table 8-1 Modem Emulation Commands and Descriptions*

| Command | Description |
|---|---|
| **+++** | Switches to Command Mode if entered from serial port during connection. |
| **AT?** | Help. |
| **ATDT<Address Info>** | Establishes the TCP connection to socket (<*ipaddress*>:<*port*>). |
| **ATDP<Address Info>** | See ATDT. |
| **ATD** | Like ATDT. Dials default Connect Mode remote address and port. |
| **ATD<Address Info>** | Sets up a TCP connection. A value of 0 begins a command line interface session. |
| **ATO** | Switches to data mode if connection still exists. Vice versa to '+++'. |

*Table 8-1 Modem Emulation Commands and Descriptions (continued)*

| Command | Description |
|---|---|
| **ATEn** | Switches echo in Command Mode (off - 0, on - 1). |
| **ATH** | Disconnects the network session. |
| **ATI** | Shows modem information. |
| **ATQn** | Quiet mode (0 - enable results code, 1 - disable results code.) |
| **ATVn** | Verbose mode (0 - numeric result codes, 1 - text result codes.) |
| **ATXn** | Command does nothing and returns OK status. |
| **ATUn** | Accept unknown commands. (n value of 0 = off. n value of 1 = on.) |
| **AT&V** | Display current and saved settings. |
| **AT&F** | Reset settings in NVR to factory defaults. |
| **AT&W** | Save active settings to NVR. |
| **ATZ** | Restores the current state from the setup settings. |
| **ATS0=n** | Accept incoming connection.<br>◆ N value of 0—Disable<br>◆ N value of 1—Connect automatically<br>◆ N value of 2+—Connect with ATA command. |
| **ATA** | Answer incoming connection (if ATS0 is 2 or greater). |
| **A/** | Repeat last valid command. |

For commands that can take address information (ATD, ATDT, ATDP), the destination address can be specified by entering the IP Address, or entering the IP Address and port number. For example, <*ipaddress*>:<*port*>. The port number cannot be entered on its own.

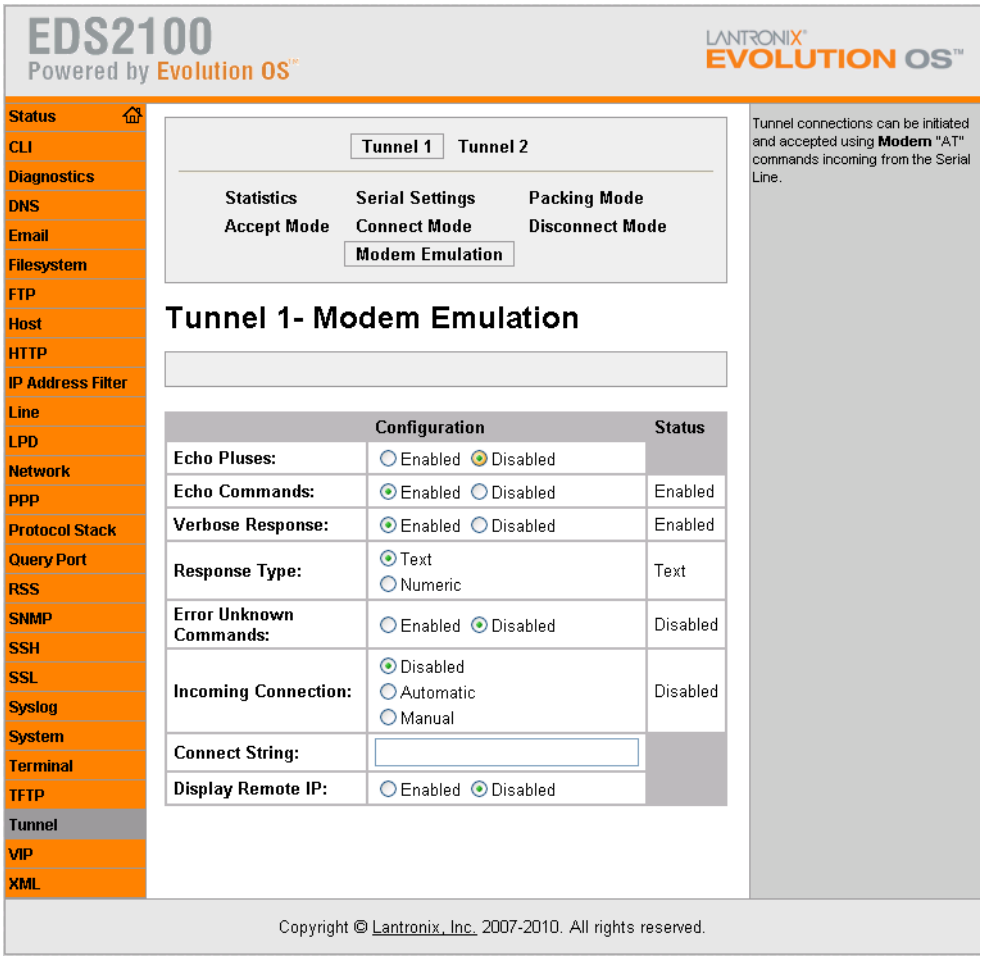
For ATDT and ATDP commands less than 255 characters, the EDS1100/2100 replaces the last segment of the IP address with the configured Connect Mode remote station address. It is possible to use the last two segments also, if they are under 255 characters. For example, if the address is 100.255.15.5, entering “ATDT 16.6” results in 100.255.16.6.

When using ATDT and ATDP, enter 0.0.0.0 to switch to the Command Line Interface (CLI). Once the CLI is exited by using the CLI exit command, the EDS1100/2100 reverts to modem emulation mode. By default, the +++ characters are not passed through the connection. Turn on this capability using the **modem echo pluses** command.

To configure modem emulation, perform the following steps.

1. Select **Tunnel 1 > Modem Emulation**. Figure 8-23 shows the page that displays.

*Figure 8-23 Tunnel 1 Modem Emulation Web Page*




2. Enter or modify the fields in Table 8-24.

*Table 8-24 Tunnel Modem Emulation Fields*

| Field | Description |
|---|---|
| **Echo Pluses** | Select **On** to echo **+++** when entering modem Command Mode. |
| **Echo Commands** | Select **On** to echo the modem commands to the console. |
| **Verbose Response** | Select **On** to send modem response codes out on the serial line. |
| **Response Type** | Select the type of response code: **Text** or **Numeric**. |
| **Error Unknown Commands** | Select whether an **ERROR** or **OK** response is sent in reply to unrecognized AT commands. Choices are:<br>◆ **Enabled**—**ERROR** is returned for unrecognized AT commands.<br>◆ **Disabled**—**OK** is returned for unrecognized AT commands. Default is **Disabled**. |
| **Incoming Connection** | Select whether Incoming Connection requests will be disabled, answered automatically, or answered manually. Default is **Disabled**. |

*Table 8-24 Tunnel Modem Emulation Fields (continued)*

| Field | Description |
|---|---|
| **Connect String** | Enter the connect string. This modem initialization string prepares the modem for communications. It is a customized string sent with the “CONNECT” modem response code. |
| **Display Remote IP** | Selects whether the incoming RING sent on the Serial Line is followed by the IP address of the caller. Default is **Disabled**. |

3. Click **Submit**.

# 9: Terminal and Host Settings

This chapter describes how to view and configure terminals and hosts. It contains the following sections:


- Terminal Settings
- Host Configuration


## Terminal Settings

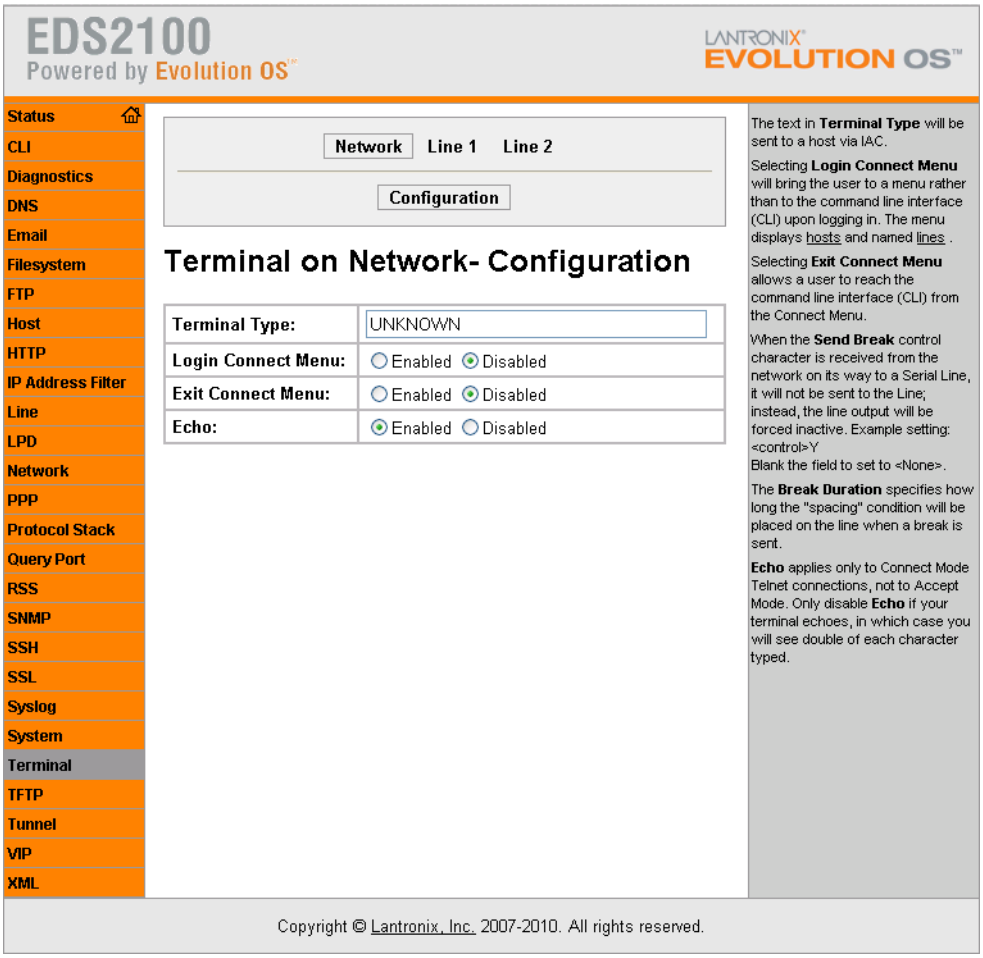
You can configure a terminal on a serial line or on the network by using the Terminal web page. When you click **Terminal** from the Main Menu, Line 1 fields display. To go to the network or line 2, click the Network or Line 2 button.

### Network Terminal Configuration

To configure menu features applicable to CLI access via the network, perform the following steps.

1. Click **Terminal > Network**. Figure 9-1 shows the page that displays.

***Figure 9-1 Terminal on Network Configuration Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Network
Line 1
Line 2
Configuration
Terminal on Network- Configuration
Terminal Type:
UNKNOWN
Login Connect Menu:
Enabled
Disabled
Exit Connect Menu:
Enabled
Disabled
Echo:
Enabled
Disabled
The text in Terminal Type will be sent to a host via IAC.
Selecting Login Connect Menu will bring the user to a menu rather than to the command line interface (CLI) upon logging in. The menu displays hosts and named lines .
Selecting Exit Connect Menu allows a user to reach the command line interface (CLI) from the Connect Menu.
When the Send Break control character is received from the network on its way to a Serial Line, it will not be sent to the Line; instead, the line output will be forced inactive. Example setting: <control>Y
Blank the field to set to <None>.
The Break Duration specifies how long the "spacing" condition will be placed on the line when a break is sent.
Echo applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable Echo if your terminal echoes, in which case you will see double of each character typed.
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2. Enter or modify the fields in Table 9-2.

***Table 9-2 Terminal on Network Configuration Fields***

| Field | Description |
|---|---|
| **Terminal Type** | Enter text to describe the type of terminal. The text will be sent to a host via interpret as command (IAC).<br>***Note:*** *IAC is a method to send commands over the network such as send break or start echoing.* |
| **Login Connect Menu** | Select the interface to display when the user logs in. Choices are:<br>**Enabled** = shows the Login Connect Menu.<br>**Disabled** = shows the CLI |
| **Exit Connect Menu** | Select whether to display a choice for the user to exit the Login Connect Menu and reach the CLI. Choices are:<br>**Enabled** = a choice allows the user to exit to the CLI.<br>**Disabled** = there is no exit to the CLI. |
| **Echo** | Applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable **Echo** if your terminal echoes, in which case you will see double of each character typed. |

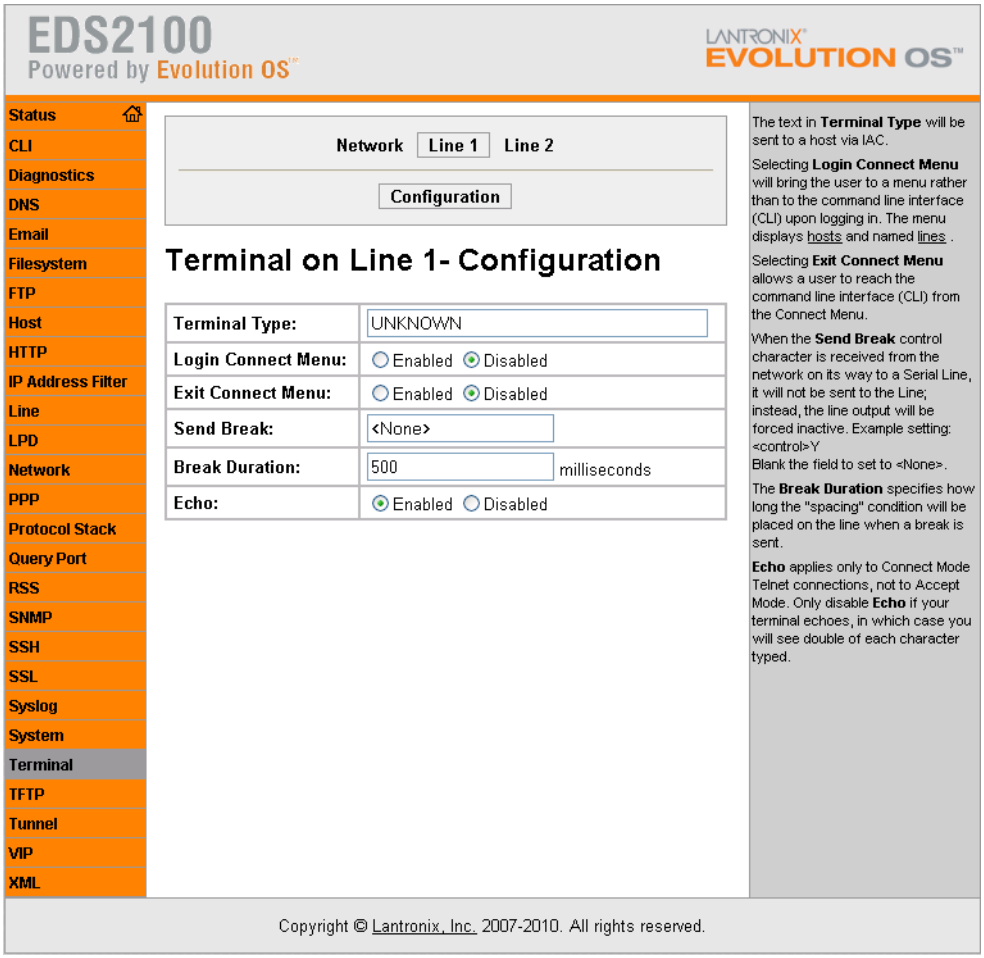
3. Click **Submit**.

## Line Terminal Configuration

To configure a line to support an attached terminal, perform the following steps.

1. Click **Terminal** on the **Main Menu**. Figure 9-3 shows the page that displays.

*Figure 9-3 Terminal on Line 1 Configuration Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Network
Line 1
Line 2
Configuration
Terminal on Line 1- Configuration
Terminal Type:
UNKNOWN
Login Connect Menu:
Enabled
Disabled
Exit Connect Menu:
Enabled
Disabled
Send Break:
<None>
Break Duration:
500
milliseconds
Echo:
Enabled
Disabled
The text in Terminal Type will be sent to a host via IAC.
Selecting Login Connect Menu will bring the user to a menu rather than to the command line interface (CLI) upon logging in. The menu displays hosts and named lines .
Selecting Exit Connect Menu allows a user to reach the command line interface (CLI) from the Connect Menu.
When the Send Break control character is received from the network on its way to a Serial Line, it will not be sent to the Line; instead, the line output will be forced inactive. Example setting: <control>Y
Blank the field to set to <None>.
The Break Duration specifies how long the "spacing" condition will be placed on the line when a break is sent.
Echo applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable Echo if your terminal echoes, in which case you will see double of each character typed.
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Enter or modify the fields in Table 9-4.

*Table 9-4 Terminal on Line 1 Configuration Fields*

| Field | Description |
|---|---|
| **Terminal Type** | Enter text to describe the type of terminal. The text will be sent to a host via interpret as command (IAC).<br>***Note:*** *IAC is a method to send commands over the network such as send break or start echoing.* |
| **Login Connect Menu** | Select the interface to display when the user logs in. Choices are:<br>◆ **Enabled** —Shows the Login Connect Menu.<br>◆ **Disabled**—Shows the CLI |
| **Exit Connect Menu** | Select whether to display a choice for the user to exit the Login Connect Menu and reach the CLI. Choices are:<br>◆ **Enabled**—A choice allows the user to exit to the CLI.<br>◆ **Disabled**—There is no exit to the CLI. |

*Table 9-4 Terminal on Line 1 Configuration Fields (continued)*

| Field | Description |
|---|---|
| **Send Break** | Enter a Send Break control character, e.g., <control> Y, or blank to disable.<br>When the Send Break control character is received from the network on its way to the serial line, it is not sent to the line; instead, the line output is forced to be inactive (the break condition). |
| **Break Duration** | Enter how long the break should last in milliseconds. |
| **Echo** | Applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable **Echo** if your terminal echoes, in which case you will see double of each character typed. |

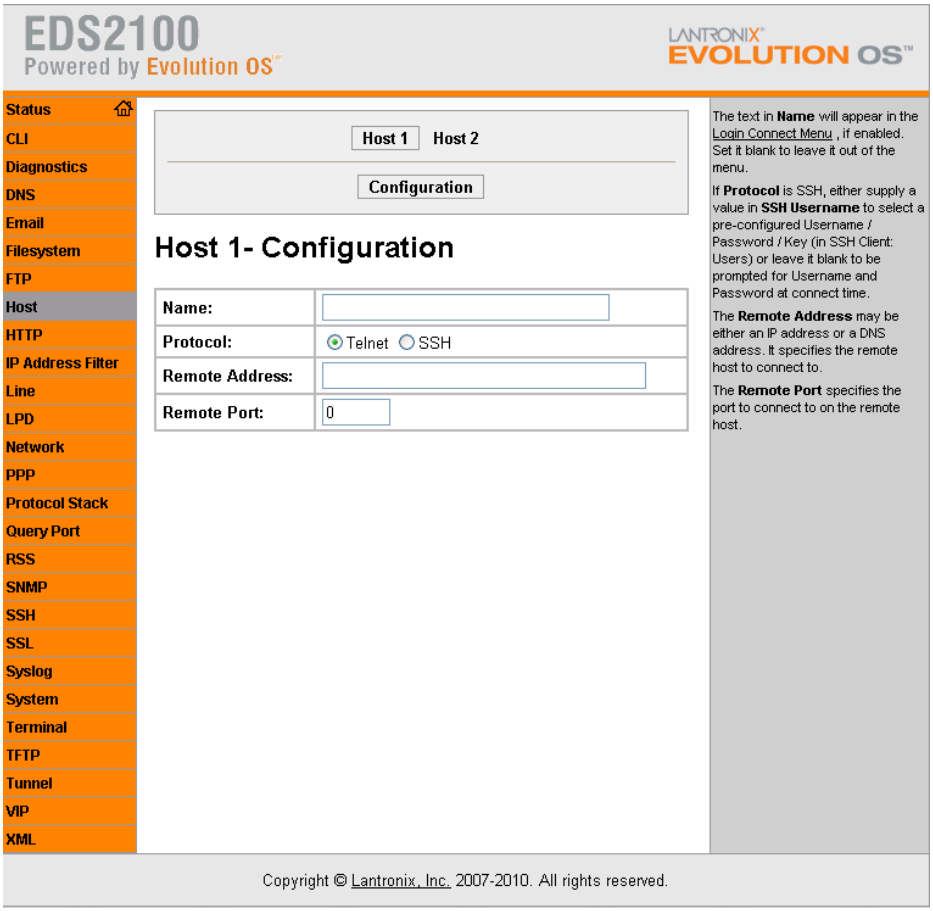
1. Click **Submit**.

# Host Configuration

You can configure a remote host by using the Host web page. To configure a remote host, perform the following steps.

1. Click **Host > Host 1** or **Host 2**. Figure 9-5 shows the page that displays.

*Figure 9-5 Host Configuration Web Page*



2. Enter or modify the fields in Table 9-6.

***Table 9-6 Host Configuration Fields***

| Field | Description |
|---|---|
| **Name** | Enter a name for the host. This name appears on the Login Connect Menu. To leave a host out of the menu, leave this field blank. |
| **Protocol** | Select the protocol to use to connect to the host. Choices are:<br>◆ Telnet<br>◆ SSH<br>***Note:*** *SSH keys must be loaded or created on the SSH page for the SSH protocol to work.* |
| **SSH Username** | Appears if you selected **SSH** as the protocol. Enter a username to select a pre-configured Username/Password/Key (configured on the SSH: Client Users page), or leave it blank to be prompted for a username and password at connect time. |
| **Remote Address** | Enter an IP address for the host to which the XPort will connect. |
| **Remote Port** | Enter the port on the host to which the XPort will connect. |

3. Click **Submit**.

# 10: Services Settings

This chapter describes the available services and how to configure each. It contains the following sections:


- DNS Status and Cache
- PPP Configuration
- SNMP Configuration
- FTP
- TFTP
- Syslog
- HTTP
- RSS
- LPD


## DNS Status and Cache

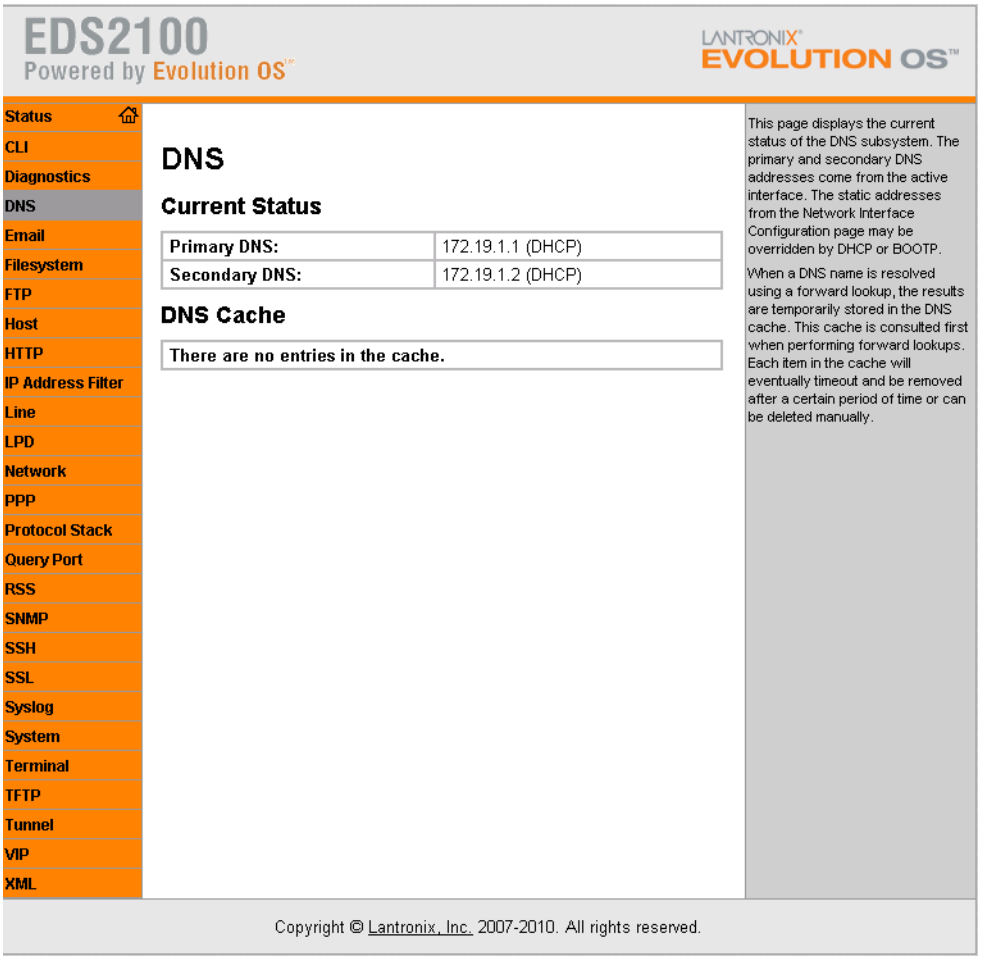
The primary and secondary domain name system (DNS) addresses come from the active interface. The static addresses displayed on the Network Interface Configuration web page may be overridden by DHCP or BOOTP. The DNS web page enables you to view the status and cache.

When a DNS name is resolved using a forward lookup, the results get stored in the DNS cache temporarily. The EDS1100/2100 checks the cache when performing forward lookups. Each item in the cache eventually times out and gets removed automatically after a certain period or you can delete it manually.

To view the DNS status and cache, perform the following steps.

1. Click **DNS** on the Main Menu. Figure 10-1 shows the page that displays.

*Figure 10-1 DNS Status and Cache Web Page*




# PPP Configuration

The Point-to-Point Protocol (PPP) establishes a direct connection between two nodes. It defines a method for data link connectivity between devices using physical layers (such as serial lines). The EDS1100/2100 supports two types of PPP authentication: Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP). Both of these authentication methods require the configuration of a username and password.

PAP is an authentication protocol in PPP. It offers a straightforward method for the peer to determine its identity. Upon the link establishment, the user ID and password are repeatedly sent to the authenticator until it is acknowledged or the connection is terminated. However, PAP is not a strong authentication process. There is no protection against trial-and-error attacks. The peer is responsible for the frequency of the communication attempts.

CHAP is a more secure method than PAP. It works by sending a challenge message to the connection requestor. Using a one-way hash function, the requestor responds with its value. If the value matches the server's own calculations, authentication is provided. Otherwise, the connection is terminated.

***Note:*** *RFC1334 defines both CHAP and PAP.*

The EDS1100/2100 also supports authentication scheme of “None” when no authentication is required during link negotiation.

Since the EDS1100/2100 does not support Network Address and Port Translation (NAPT), static routing table entries must be added to the serial-side and network-side devices (both of which are external devices).

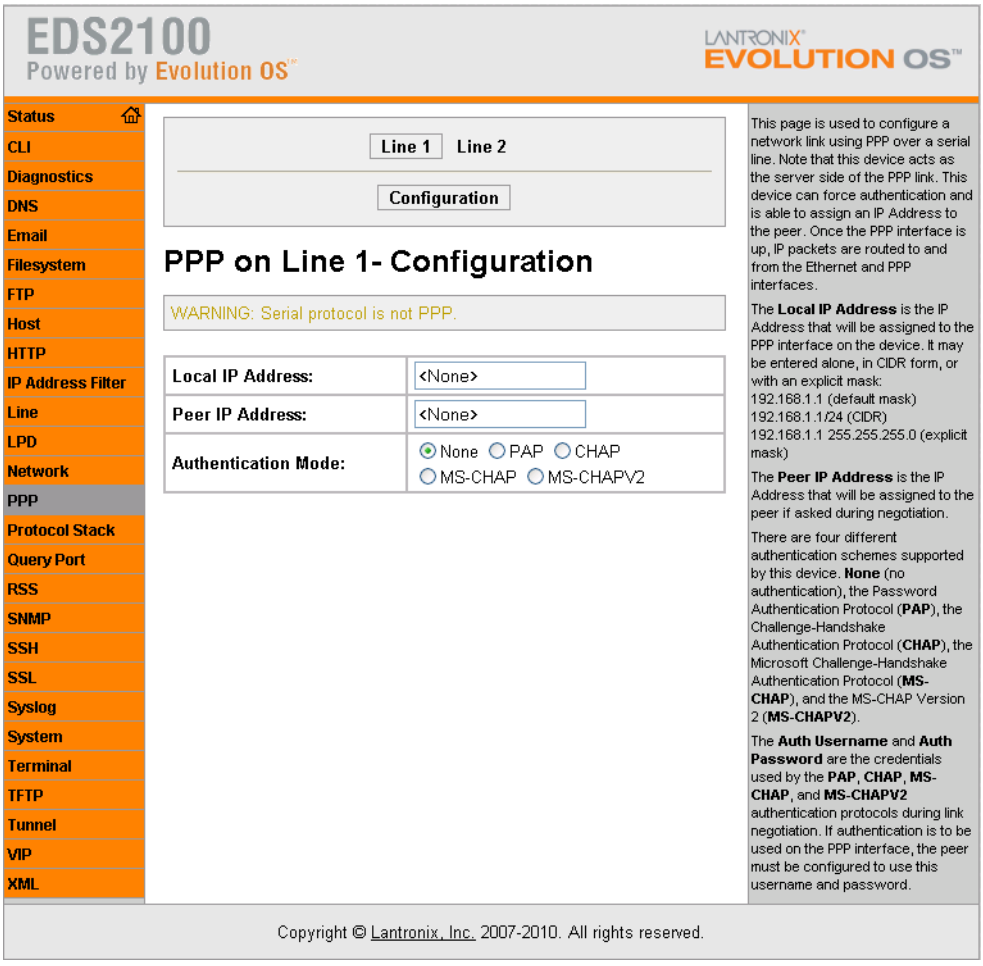
Use the EDS1100/2100 Web Manager or CLI to configure a network link using PPP over a serial line. Turn off Connect Mode, Accept Mode, and Command mode before enabling PPP. The EDS1100/2100 acts as the server side of the PPP link; it can require authentication and assign an IP address to the peer. Upon PPP configuration, IP packets are routed between Ethernet and PPP interfaces.

The EDS1100/2100 does not perform network address translation (NAT) between the serial-side network interface and the Ethernet/WLAN network interface. Therefore, to pass packets through the EDS1100/2100, a static route must be configured on both the PPP Peer device and the remote device it wishes to communicate with. The static route in the PPP Peer device must use the PPP Local IP Address as its gateway, and the static route in the remote device must use the Ethernet/ WLAN IP Address of the EDS1100/2100 as its gateway.

To configure PPP, perform the following steps.

1. Click **PPP** on the Main Menu. Figure 10-2 shows the page that displays.

***Figure 10-2 PPP Configuration Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Line 1
Line 2
Configuration
PPP on Line 1- Configuration
WARNING: Serial protocol is not PPP.
Local IP Address:
<None>
Peer IP Address:
<None>
Authentication Mode:
None PAP CHAP
MS-CHAP MS-CHAPV2
This page is used to configure a network link using PPP over a serial line. Note that this device acts as the server side of the PPP link. This device can force authentication and is able to assign an IP Address to the peer. Once the PPP interface is up, IP packets are routed to and from the Ethernet and PPP interfaces.
The Local IP Address is the IP Address that will be assigned to the PPP interface on the device. It may be entered alone, in CIDR form, or with an explicit mask:
192.168.1.1 (default mask)
192.168.1.1/24 (CIDR)
192.168.1.1 255.255.255.0 (explicit mask)
The Peer IP Address is the IP Address that will be assigned to the peer if asked during negotiation.
There are four different authentication schemes supported by this device. None (no authentication), the Password Authentication Protocol (PAP), the Challenge-Handshake Authentication Protocol (CHAP), the Microsoft Challenge-Handshake Authentication Protocol (MS-CHAP), and the MS-CHAP Version 2 (MS-CHAPV2).
The Auth Username and Auth Password are the credentials used by the PAP, CHAP, MS-CHAP, and MS-CHAPV2 authentication protocols during link negotiation. If authentication is to be used on the PPP interface, the peer must be configured to use this username and password.
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2. Enter or modify the fields in Table 10-1.

***Table 10-1 PPP Configuration Fields***

| Field | Description |
|---|---|
| **Local IP Address** | Enter the IP address assigned to the EDS1100/2100's PPP interface. |
| **Peer IP Address** | Enter the IP address assigned to the peer (when requested during negotiation). |
| **Authentication Mode** | Choose the authentication mode:<br>◆ **None**—No authentication is required.<br>◆ **PAP**—Password Authentication Protocol.<br>◆ **CHAP**—Challenge Handshake Authentication Protocol. |

3. Click **Submit**.

## SNMP Configuration

Simple Network Management Protocol (SNMP) is a network management tool that monitors network devices for conditions that need attention. The Web Manager configured SNMP service sends traps whenever a request for information that contains an incorrect community name and does not match an accepted system name for the service gets sent.

To configure SNMP, perform the following steps.

1. Click **SNMP** on the Main Menu. Figure 10-3 shows the page that displays.

*Figure 10-3 SNMP Web Page*

2. Enter or modify the fields in Table 10-2.

*Table 10-2 SNMP Fields*

| Field | Description |
|---|---|
| **SNMP Agent** | Select On to enable SNMP. |
| **Read Community** | Enter the SNMP read-only community string. |
| **Write Community** | Enter the SNMP read/write community string. |
| **System Contact** | Enter the name of the system contact. |
| **System Name** | Enter the system name. |
| **System Description** | Enter the system description. |
| **System Location** | Enter the system location. |
| **Traps Enabled** | Select On to enable the transmission of the SNMP cold start trap messages. This trap is generated during system boot. |

*Table 10-2 SNMP Fields (continued)*

| Field | Description |
|---|---|
| **Primary Trap Dest IP** | Enter the primary SNMP trap host. |
| **Secondary Trap Dest IP** | Enter the secondary SNMP trap host. |

3. Click **Submit**.

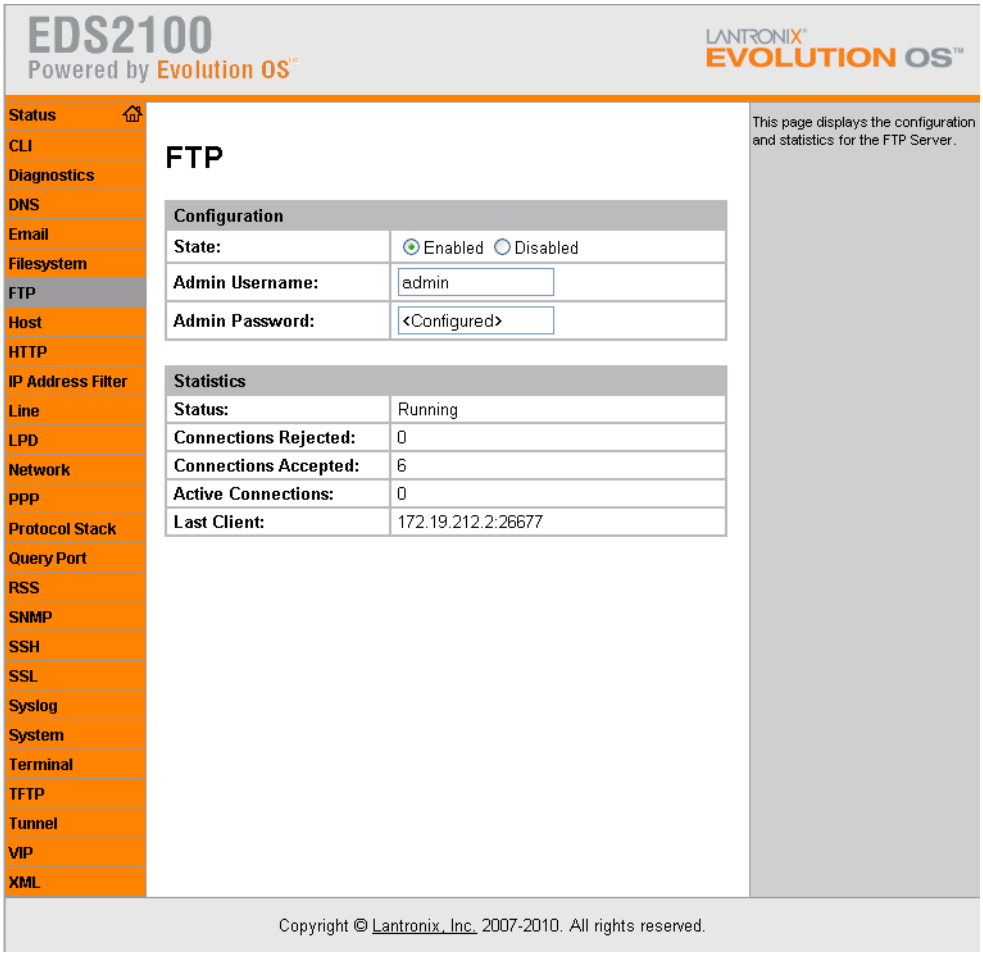
***Note:*** *You can delete the read and write communities, and system name by clicking the [**Delete**] link in the **Current Configuration** table.*

# FTP

The FTP web page shows the FTP configuration and statistics about the FTP server. To configure FTP, perform the following steps.

1. Click **FTP** on the Main Menu. Figure 10-4 shows the page that displays.

***Figure 10-4 FTP Web Page***



2. Enter or modify the fields in Table 10-3.

***Table 10-3 FTP Fields***

| Field | Description |
|---|---|
| **State** | Select **Enabled** to enable the FTP server. |
| **Admin Username** | Enter the username to use when logging in via FTP. |
| **Admin Password** | Enter the password to use when logging in via FTP. |

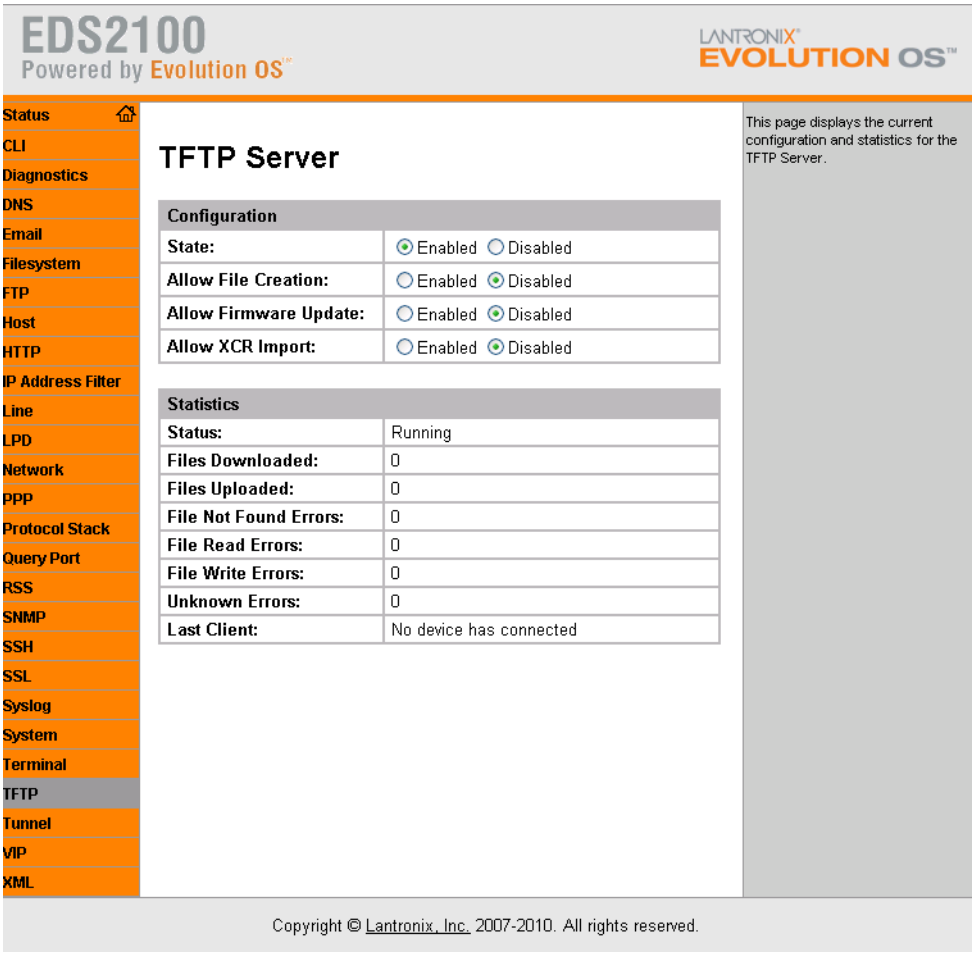
3. Click **Submit**.

# TFTP

In the TFTP web page, you can configure the server, and view the status and statistics. To configure TFTP server, perform the following steps.

1. Click **TFTP** on the Main Menu. Figure 10-5 shows the page that displays.

***Figure 10-5 TFTP Server Web Page***



2. Enter or modify the fields in Table 10-4.

***Table 10-4 TFTP Server Fields***

| Field | Description |
|---|---|
| **State** | Select **Enabled** to enable the TFTP server. |
| **Allow TFTP File Creation** | Select whether to allow the creation of new files stored on the TFTP server. |
| **Allow Firmware Update** | Specifies whether or not the TFTP Server is allowed to accept a firmware update for the device. An attempt to update firmware is recognized based on the name of the file.<br>***Note:*** *TFTP cannot authenticate the client so the device is open to malicious updates.* |

3. Click **Submit**.

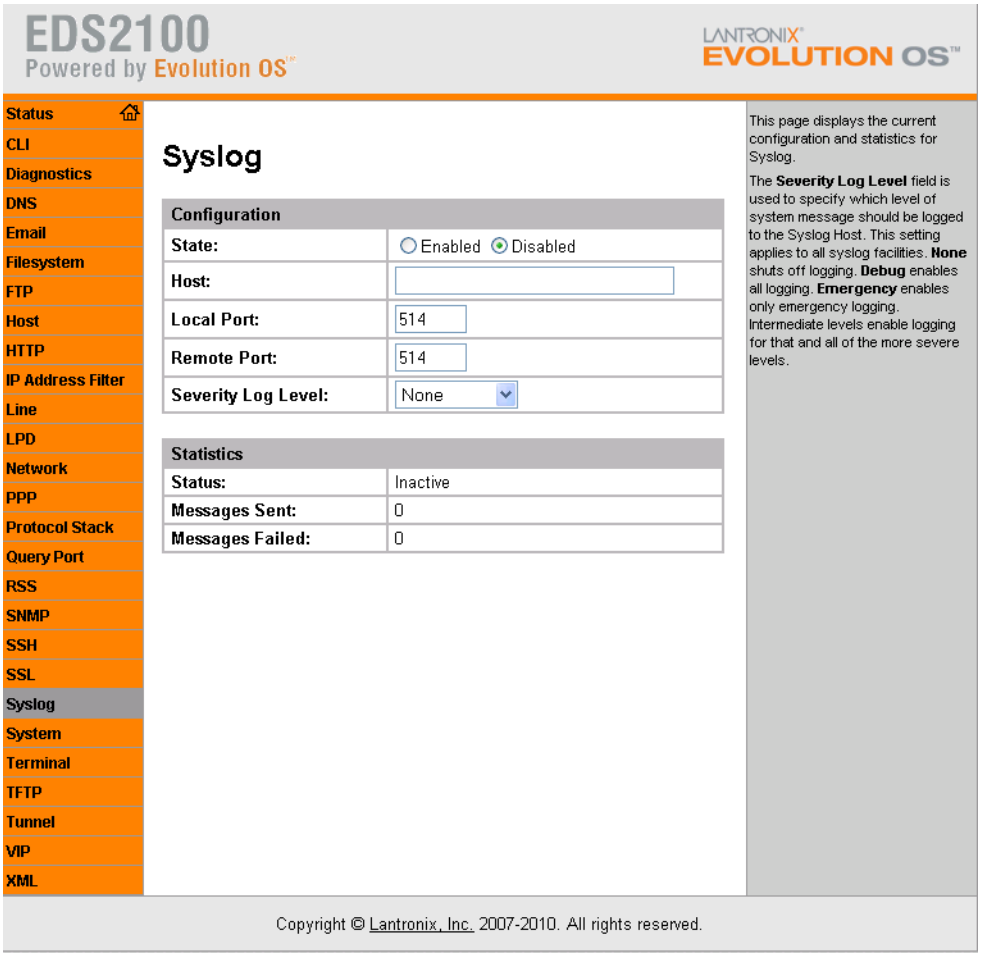
# Syslog

In the Syslog web page, you can configure settings, and view statistics and status. To configure the Syslog, perform the following steps.

***Note:*** *The Syslog file gets saved to lRAM and gets discarded when the EDS1100/2100 reboots. Saving the Syslog file to a server that supports remote logging services (see RFC 3164) allows the administrator to save the complete Syslog history. The default port is 514.*

1. Click **Syslog** on the Main Menu. Figure 10-6 shows the page that displays.

*Figure 10-6 Syslog Web Page*




2. Enter or modify the fields in Table 10-5

*Table 10-5 Syslog Fields*

| Field | Description |
|---|---|
| **State** | Select to enable or disable the syslog. |
| **Host** | Enter the IP address of the remote server to which system logs are sent for storage. |
| **Local Port** | Enter the number of the local port on the EDS1100/2100 from which system logs are sent. |
| **Remote Port** | Enter the number of the port on the remote server that supports logging services. The default is **514**. |
| **Severity Log Level** | From the drop-down box, select the minimum level of system message the EDS1100/2100 should log. This setting applies to all syslog facilities. The drop-down list is in descending order of severity (e.g., **Emergency** is more severe than **Alert.**) |

# HTTP

HyperText Transfer Protocol (HTTP) is an application layer standard for Internet documents. HTTP defines how messages get formatted and transmitted. It also defines the actions web servers and browsers should take in response to different commands. HTTP Authentication enables the requirement of usernames and passwords for access to the EDS1100/2100 device.

The HTTP web page contains the following sub-menus:

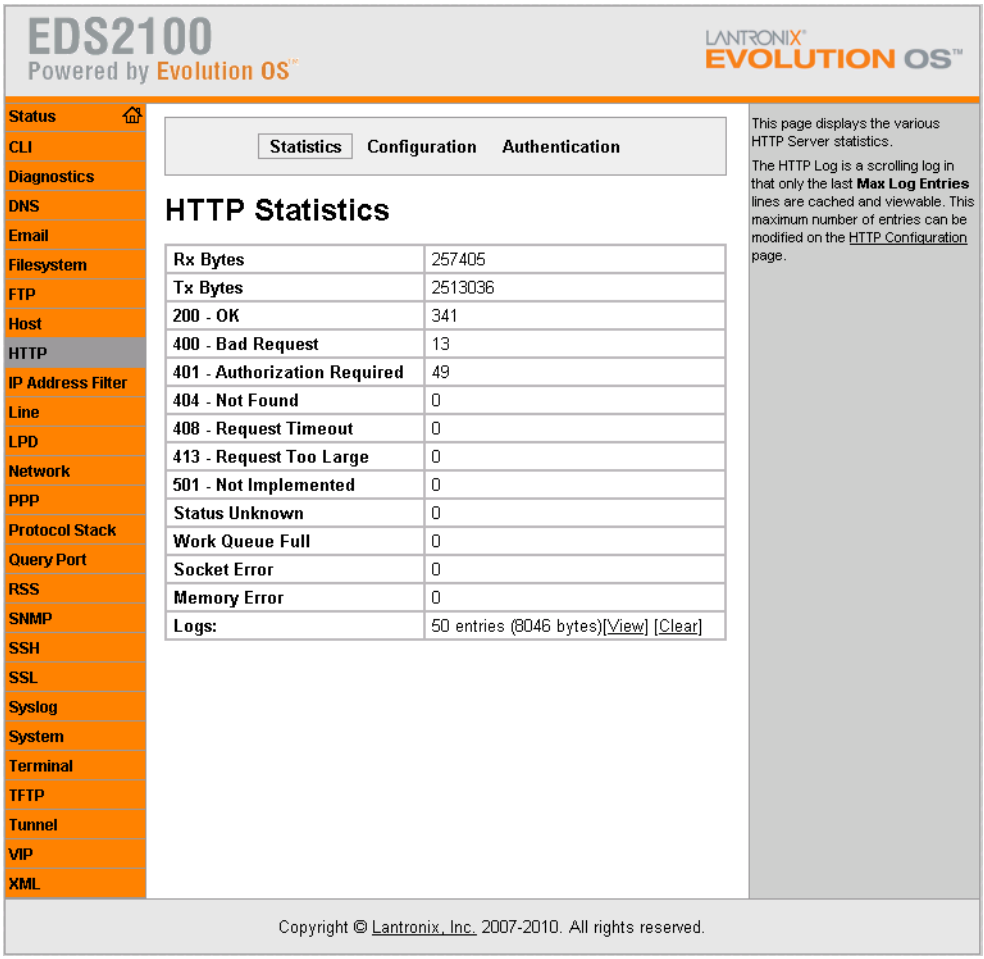
- Statistics—Viewing statistics such as bytes received and transmitted, bad requests, authorizations required, etc.
- Configuration—Configuring and viewing the current configuration.
- Authentication—Configuring and viewing the authentication.

## HTTP Statistics

To view HTTP statistics, perform the following steps.

1. Click **HTTP > Statistics**. Statistics is the default. Figure 10-7 shows the page that displays.

***Figure 10-7 HTTP Statistics Web Page***



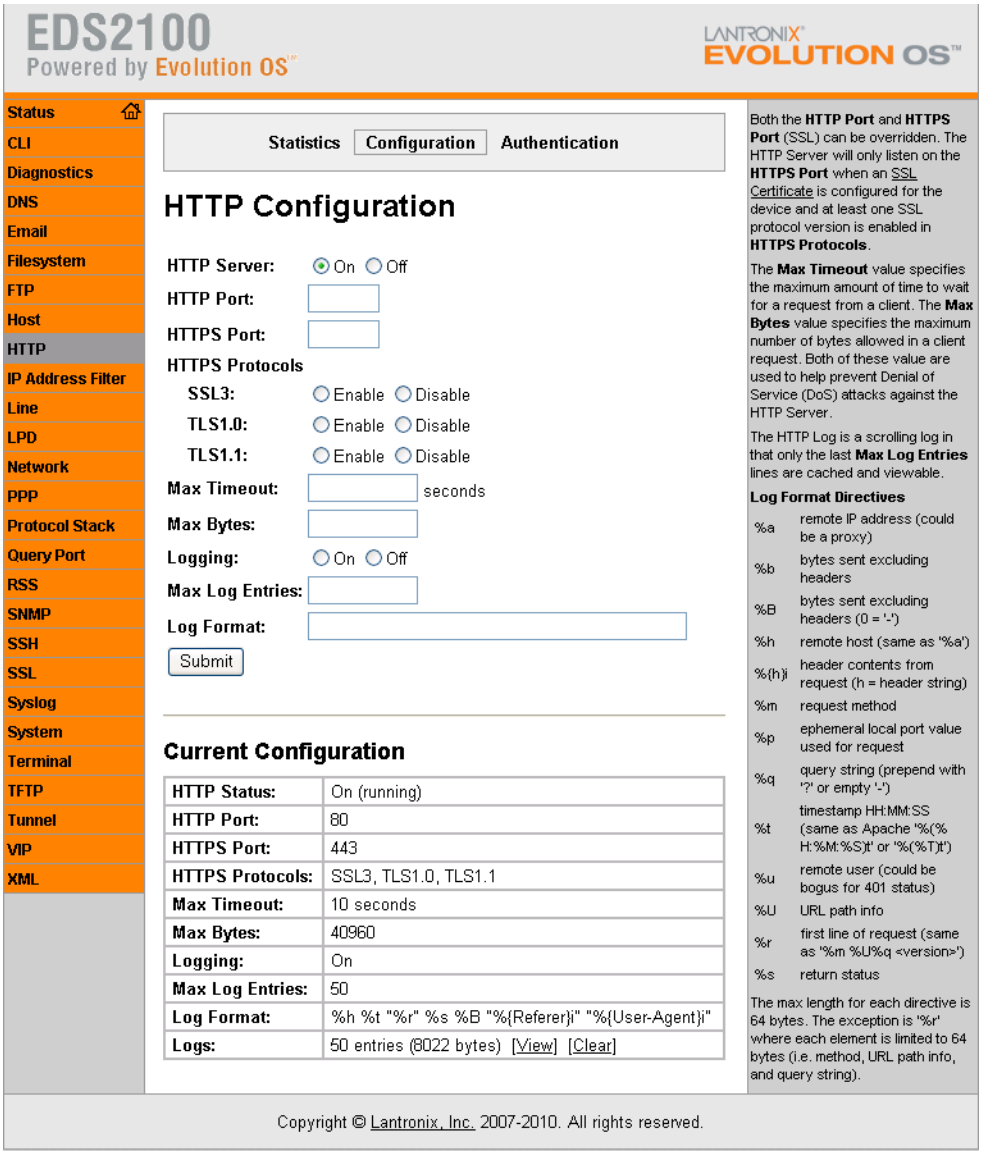
***Note:*** *The HTTP log is a scrolling log, with the last Max Log Entries cached and viewable. You can change the maximum number of entries that can be viewed on the HTTP Configuration Web Page.*

## HTTP Configuration

To configure HTTP, perform the following steps.

1. Click **HTTP > Configuration**. Figure 10-8 shows the page that displays.

***Figure 10-8 HTTP Configuration Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Statistics
Configuration
Authentication
HTTP Configuration
HTTP Server: On Off
HTTP Port:
HTTPS Port:
HTTPS Protocols
SSL3: Enable Disable
TLS1.0: Enable Disable
TLS1.1: Enable Disable
Max Timeout: seconds
Max Bytes:
Logging: On Off
Max Log Entries:
Log Format:
Submit
Current Configuration
HTTP Status: On (running)
HTTP Port: 80
HTTPS Port: 443
HTTPS Protocols: SSL3, TLS1.0, TLS1.1
Max Timeout: 10 seconds
Max Bytes: 40960
Logging: On
Max Log Entries: 50
Log Format: %h %t "%r" %s %B "%{Referer}i" "%{User-Agent}i"
Logs: 50 entries (8022 bytes) [View] [Clear]
Both the HTTP Port and HTTPS Port (SSL) can be overridden. The HTTP Server will only listen on the HTTPS Port when an SSL Certificate is configured for the device and at least one SSL protocol version is enabled in HTTPS Protocols.
The Max Timeout value specifies the maximum amount of time to wait for a request from a client. The Max Bytes value specifies the maximum number of bytes allowed in a client request. Both of these value are used to help prevent Denial of Service (DoS) attacks against the HTTP Server.
The HTTP Log is a scrolling log in that only the last Max Log Entries lines are cached and viewable.
Log Format Directives
%a remote IP address (could be a proxy)
%b bytes sent excluding headers
%B bytes sent excluding headers (0 = '-')
%h remote host (same as '%a')
%{h}i header contents from request (h = header string)
%m request method
%p ephemeral local port value used for request
%q query string (prepend with '?' or empty '-')
%t timestamp HH:MM:SS (same as Apache '%{%H:%M:%S}t' or '%{%T}t')
%u remote user (could be bogus for 401 status)
%U URL path info
%r first line of request (same as '%m %U%q <version>')
%s return status
The max length for each directive is 64 bytes. The exception is '%r' where each element is limited to 64 bytes (i.e. method, URL path info, and query string).
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2. Enter or modify the fields in Table 10-6.

***Table 10-6 HTTP Configuration Fields***

| Field | Description |
|---|---|
| **HTTP Server** | Select **On** to enable the HTTP server. |

*Table 10-6 HTTP Configuration Fields (continued)*

| Field | Description |
|---|---|
| **HTTP Port** | Enter the port for the HTTP server to use. The default is **80**. |
| **HTTPS Port** | Enter the port for the HTTPS server to use. The default is **443**. The HTTP server only listens on the **HTTPS Port** when an SSL certificate is configured. |
| **HTTPS Protocols** | Select to enable or disable the following protocols:<br>◆ **SSL3** = Secure Sockets Layer version 3<br>◆ **TLS1.0** = Transport Layer Security version 1.0. TLS 1.0 is the successor of SSL3 as defined by the IETF.<br>◆ **TLS1.1** = Transport Layer Security version 1.1<br>The protocols are enabled by default.<br>***Note:*** *A server certificate and associated private key needs to be installed in the **SSL** configuration section to use **HTTPS**.* |
| **Max Timeout** | Enter the maximum time for the HTTP server to wait when receiving a request. This prevents Denial-of-Service (DoS) attacks. The default is **10** seconds. |
| **Max Bytes** | Enter the maximum number of bytes the HTTP server accepts when receiving a request. The default is **40** kB (this prevents DoS attacks). |
| **Logging** | Select **On** to enable HTTP server logging. |
| **Max Log Entries** | Sets the maximum number of HTTP server log entries. Only the last **Max Log Entries** are cached and viewable. |
| **Log Format** | Set the log format string for the HTTP server. Follow these **Log Format** rules:<br>◆ %a—Remote IP address (could be a proxy)<br>◆ %b—Bytes sent excluding headers<br>◆ %B—Bytes sent excluding headers (0 = '-')<br>◆ %h—Remote host (same as '%a')<br>◆ %{h}i—Header contents from request (h = header string)<br>◆ %m—Request method<br>◆ %p—Ephemeral local port value used for request<br>◆ %q—Query string (prepend with '?' or empty '-')<br>◆ %t—Timestamp HH:MM:SS (same as Apache '%(%H:%M:%S)t' or '%(%T)t')<br>◆ %u—Remote user (could be bogus for 401 status)<br>◆ %U—URL path info<br>◆ %r—Rirst line of request (same as '%m %U%q <version>')<br>◆ %s—Return status |

3. Click Submit.

## HTTP Authentication

To configure HTTP authentication, perform the following steps.

1. Click **HTTP > Authentication**. Figure 10-9 shows the page that displays.

***Figure 10-9 HTTP Authentication Web Page***

2. Enter or modify the fields in Table 10-7.

***Table 10-7 HTTP Authentication Fields***

| Fields | Description |
|---|---|
| **URI** | Enter the Uniform Resource Identifier (URI).<br>***Note:*** *The URI must begin with '/' to refer to the filesystem.* |
| **Realm** | Enter the domain, or realm, used for HTTP. Required with the **URI** field. |

*Table 10-7 HTTP Authentication Fields (continued)*

| Fields | Description |
|---|---|
| **Auth Type** | Select the authentication type:<br>◆ **None**—No authentication is necessary.<br>◆ **Basic**—Encodes passwords using Base64.<br>◆ **Digest**—Encodes passwords using MD5.<br>◆ **SSL**—The page can only be accessed over SSL (no password is required).<br>◆ **SSL/Basic**—The page is accessible only over SSL and encodes passwords using Base64.<br>◆ **SSL/Digest**—The page is accessible only over SSL and encodes passwords using MD5. |
| **Username** | Enter the **Username** used to access the **URI**.<br>***Note:*** *More than one username per URI is permitted. Click **Submit** and enter the next **Username**.* |
| **Password** | Enter the **Password** for the **Username**. |

3. Click **Submit.**

***Notes:***

- You can delete URI and users by clicking the **[Delete]** link in the **Current Configuration** table.
- The URI, realm, username, and password are user-specified, free-form fields. The URI must match the directory created on the filesystem.

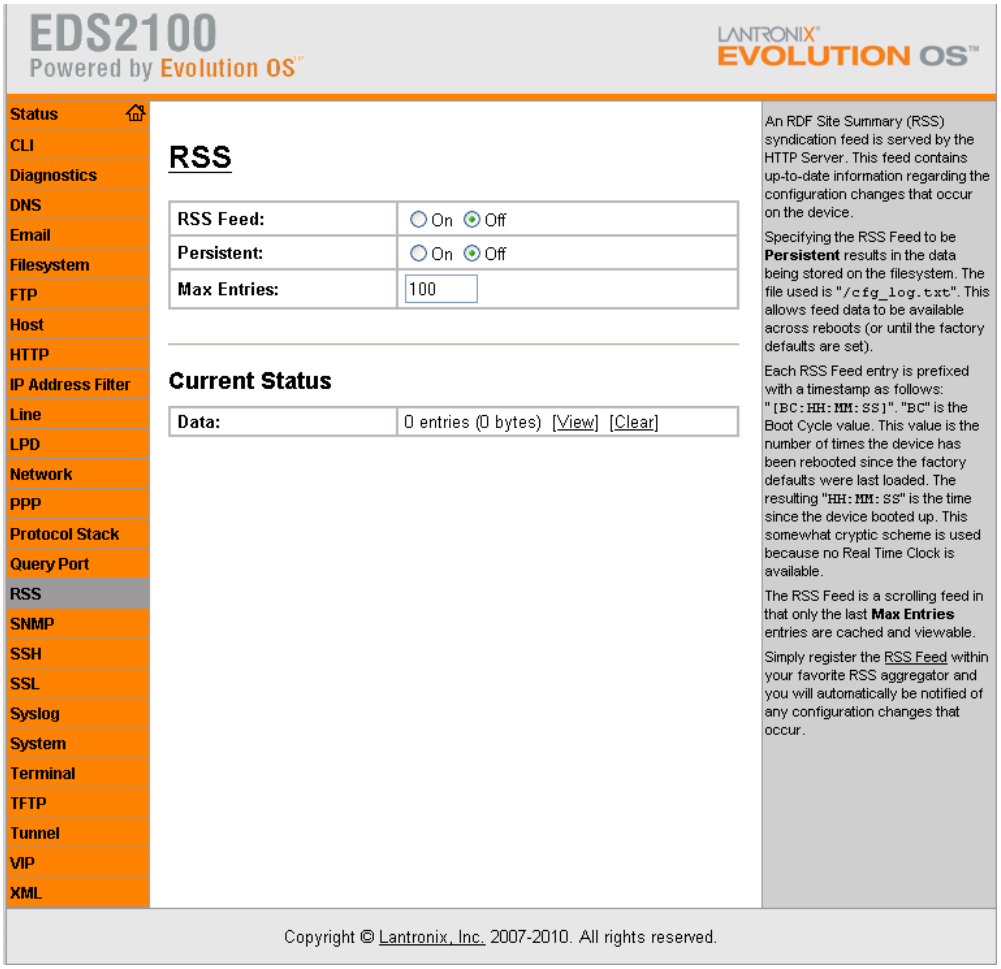
# RSS

Really Simple Syndication (RSS) (sometimes referred to as Rich Site Summary) is a method of sending online content to Web users. Instead of actively searching for EDS1100/2100 configuration changes, RSS enables viewing relevant and new information regarding changes made to the EDS1100/2100 via an RSS publisher. RSS can be stored to the file system cfg_log.txt file.

To configure RSS, perform the following steps.

1. Click **RSS** on the Main Menu. Figure 10-10 shows the page that displays.

*Figure 10-10 RSS Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
RSS
RSS Feed: On Off
Persistent: On Off
Max Entries: 100
Current Status
Data: 0 entries (0 bytes) [View] [Clear]
An RDF Site Summary (RSS) syndication feed is served by the HTTP Server. This feed contains up-to-date information regarding the configuration changes that occur on the device.
Specifying the RSS Feed to be Persistent results in the data being stored on the filesystem. The file used is "/cfg_log.txt". This allows feed data to be available across reboots (or until the factory defaults are set).
Each RSS Feed entry is prefixed with a timestamp as follows: "[BC:HH:MM:SS]". "BC" is the Boot Cycle value. This value is the number of times the device has been rebooted since the factory defaults were last loaded. The resulting "HH:MM:SS" is the time since the device booted up. This somewhat cryptic scheme is used because no Real Time Clock is available.
The RSS Feed is a scrolling feed in that only the last Max Entries entries are cached and viewable.
Simply register the RSS Feed within your favorite RSS aggregator and you will automatically be notified of any configuration changes that occur.
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2. Enter or modify the fields in Table 10-8.

*Table 10-8 RSS Fields*

| Fields | Description |
|---|---|
| **RSS Feed** | Select **On** to enable RSS feeds to an RSS publisher. |
| **Persistent** | Select **On** to enable the RSS feed to be written to a file (cfg_log.txt) and to be available across reboots. |
| **Max Entries** | Sets the maximum number of log entries. Only the last **Max Entries** are cached and viewable. |

3. Click **Submit**.

***Note:*** *You can view and clear settings in the **Current Status** table by clicking [View] or [Clear].*

# LPD

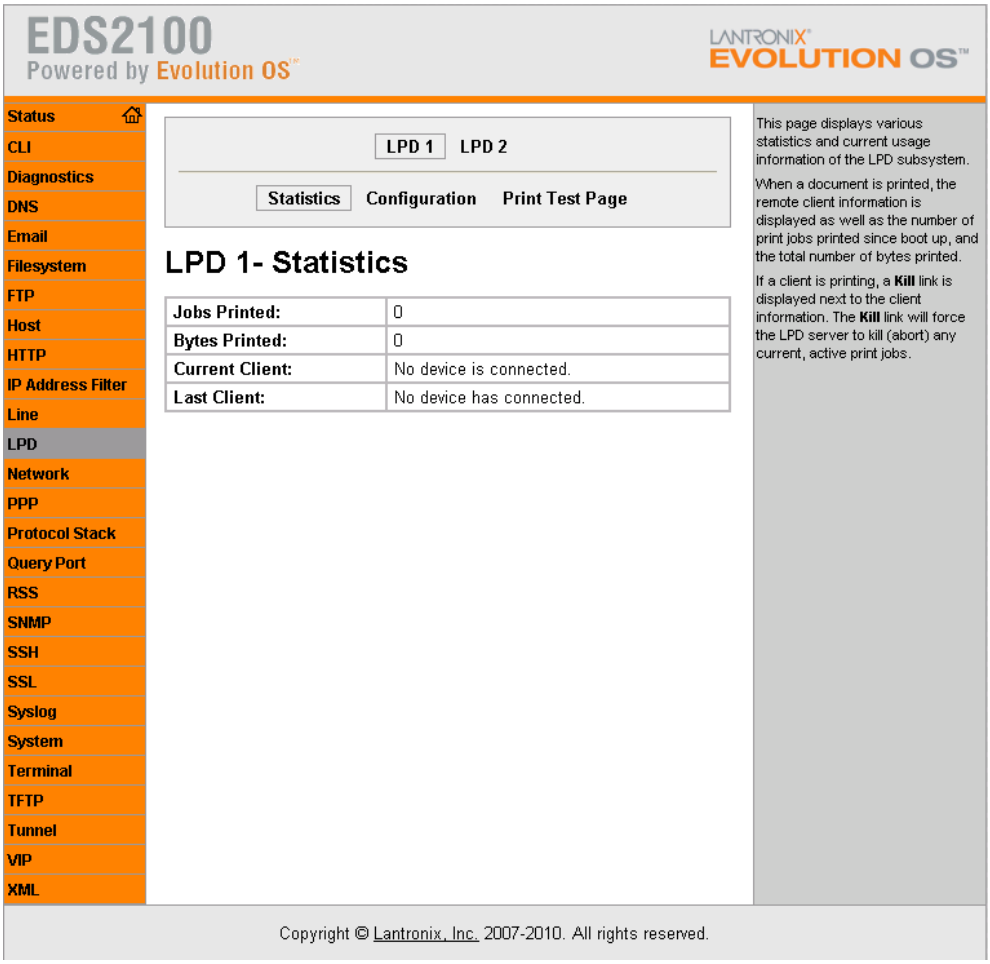
The EDS1100/2100 acts as a print server if a printer gets connected to one of its serial ports. Clicking the Line Printer Daemon (LPD) link in the Main Menu displays the LPD web page. The LPD web page has three sub-menus for viewing print queue statistics, changing print queue configuration, and printing a test page. Because the LPD lines operate independently, you can specify different configuration settings for each.

## LPD Statistics

To view LPD statistics, perform the following steps.

1. Click **LPD** on the Main Menu. Figure 10-11 shows the page that displays.

***Figure 10-11 LPD Web Page***

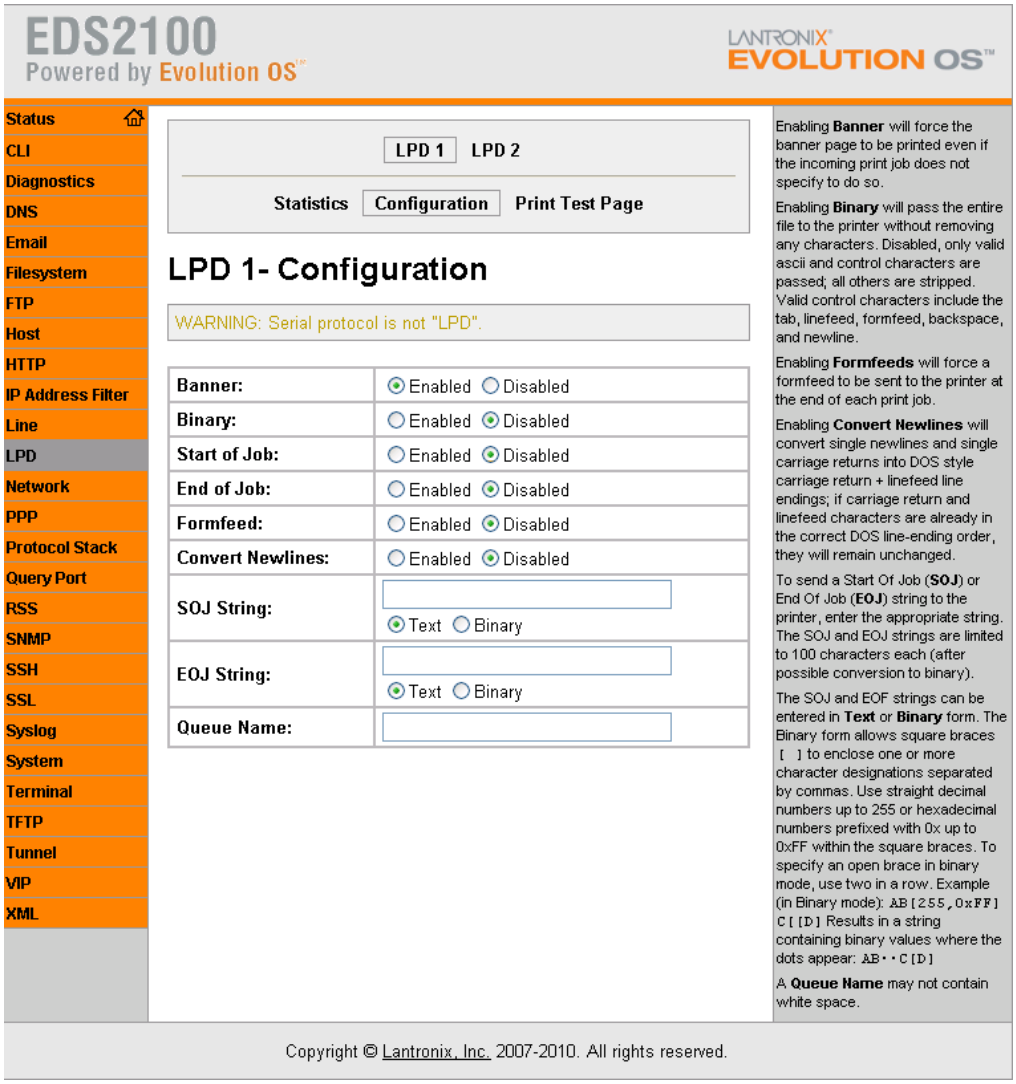



## LPD Configuration

To configure LPD, perform the following steps.

1. Click **LPD > Configuration**. Figure 10-12 shows the page that displays.

*Figure 10-12 LPD Configuration Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
LPD 1
LPD 2
Statistics
Configuration
Print Test Page
LPD 1- Configuration
WARNING: Serial protocol is not "LPD".
Banner: Enabled Disabled
Binary: Enabled Disabled
Start of Job: Enabled Disabled
End of Job: Enabled Disabled
Formfeed: Enabled Disabled
Convert Newlines: Enabled Disabled
SOJ String: Text Binary
EOJ String: Text Binary
Queue Name:
Enabling Banner will force the banner page to be printed even if the incoming print job does not specify to do so.
Enabling Binary will pass the entire file to the printer without removing any characters. Disabled, only valid ascii and control characters are passed; all others are stripped. Valid control characters include the tab, linefeed, formfeed, backspace, and newline.
Enabling Formfeeds will force a formfeed to be sent to the printer at the end of each print job.
Enabling Convert Newlines will convert single newlines and single carriage returns into DOS style carriage return + linefeed line endings; if carriage return and linefeed characters are already in the correct DOS line-ending order, they will remain unchanged.
To send a Start Of Job (SOJ) or End Of Job (EOJ) string to the printer, enter the appropriate string. The SOJ and EOJ strings are limited to 100 characters each (after possible conversion to binary).
The SOJ and EOF strings can be entered in Text or Binary form. The Binary form allows square braces [ ] to enclose one or more character designations separated by commas. Use straight decimal numbers up to 255 or hexadecimal numbers prefixed with 0x up to 0xFF within the square braces. To specify an open brace in binary mode, use two in a row. Example (in Binary mode): AB[255,0xFF]C[[D] Results in a string containing binary values where the dots appear: AB▪▪C[D]
A Queue Name may not contain white space.
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2. Enter or modify the fields in Table 10-9.

*Table 10-9 LPD Configuration Fields*

| Field | Description |
|---|---|
| **Banner** | Select **Enabled** to print the banner even if the print job does not specify to do so. Selected by default. |
| **Binary** | Select **Enabled** for the EDS1100/2100 to pass the entire file to the printer unchanged. Otherwise, the EDS1100/2100 passes only valid ASCII and valid control characters to the printer. Valid control characters include the tab, linefeed, formfeed, backspace, and newline characters. All others are stripped. Disabled by default. |
| **Start of Job** | Select **Enabled** to print a "start of job" string before sending the print data. |
| **End of Job** | Select **Enabled** to send an "end of job" string. |
| **Formfeed** | Select **Enabled** to force the printer to advance to the next page at the end of each print job. |

*Table 10-9 LPD Configuration Fields (continued)*

| Field | Description |
|---|---|
| **Convert Newlines** | Select **Enabled** to convert single newlines and carriage returns to DOS-style line endings. |
| **SOJ String** | If **Start of Job** (above) is enabled, enter the string to be sent to the printer at the beginning of a print job. The limit is 100 characters.<br>Indicate whether the string is in text or binary format. |
| **EOJ String** | If **End of Job** (above) is enabled, enter the string to send at the end of a print job. The limit is 100 characters. Indicate whether the string is in text or binary format. |
| **Queue Name** | To change the name of the print queue, enter a new name. The name cannot have white space in it and is limited to 31 characters. The default is **LPDQueueX** (**for line number X**) |

# 11: Security Settings

The EDS1100/2100 supports Secure Shell (SSH) and Secure Sockets Layer (SSL). SSH is a network protocol for securely accessing a remote device. SSH provides a secure, encrypted communication channel between two hosts over a network. It provides authentication and message integrity services.

Secure Sockets Layer (SSL) is a protocol that manages data transmissiong security over the Internet. It uses digital certificates for authentication and cryptography against eavesdropping and tampering. It provides encryption and message integrity services. SSL is widely used for secure communication to a web server. SSL uses certificates and private keys.

***Note:*** *The EDS1100/2100 supports SSLv3 and its successors, TLS1.0 and TLS1.1. An incoming SSlv2 connection attempt is answered with an SSlv3 response. If the initiator also supports SSLv3, SSLv3 handles the rest of the connection.*

This chapter contains the following sections:


- SSH Server Host Keys
- SSH Server Authorized Users
- SSH Client Known Hosts
- SSH Client User Configuration
- SSH Server Host Keys
- SSL Certificates
- SSL RSA or DSA
- SSL Certificates and Private Keys
- SSL Utilities
- SSL Configuration


## SSH Server Host Keys

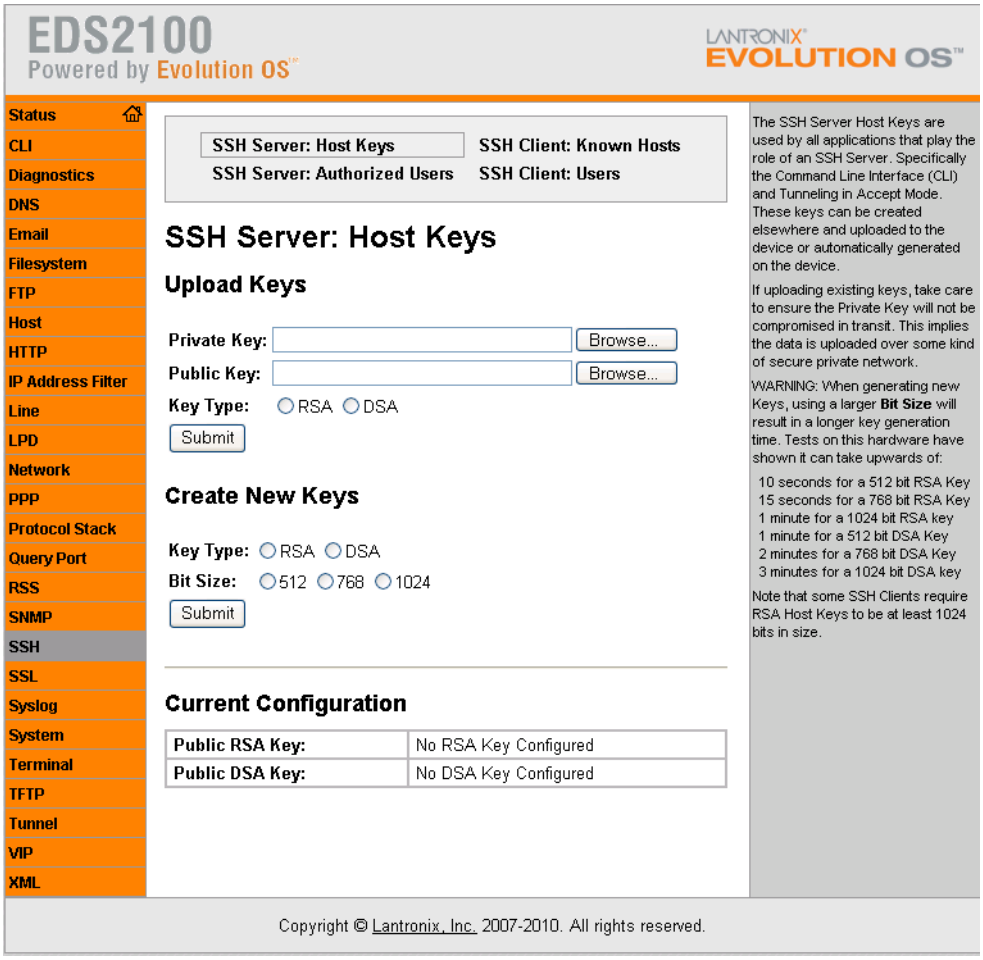
The SSH Server Host Keys web page opens when you click SSH from the Main Menu. It has four sub-menus for viewing and changing SSH server host keys, SSH server authorized keys, SSH client known hosts, and SSH client users.

***Note:*** *SSH keys may be created on another computer and uploaded to the EDS1100/2100. For example, use the* ***ssh-keygen -b 1024 -t dsa*** *command to create a 1024-bit DSA key pair. SSH Keys from other programs may be converted to the required EDS1100/2100 format. Use* ***Open SSH*** *to perform the conversion.*

To create or upload SSH server host keys, perform the following steps.

1. Click **SSH** on the Main Menu. Figure 11-1 shows the page that displays.

*Figure 11-1 SSH Server Host Keys Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
SSH Server: Host Keys
SSH Client: Known Hosts
SSH Server: Authorized Users
SSH Client: Users
SSH Server: Host Keys
Upload Keys
Private Key:
Browse...
Public Key:
Browse...
Key Type: RSA DSA
Submit
Create New Keys
Key Type: RSA DSA
Bit Size: 512 768 1024
Submit
Current Configuration
Public RSA Key: No RSA Key Configured
Public DSA Key: No DSA Key Configured
The SSH Server Host Keys are used by all applications that play the role of an SSH Server. Specifically the Command Line Interface (CLI) and Tunneling in Accept Mode. These keys can be created elsewhere and uploaded to the device or automatically generated on the device.
If uploading existing keys, take care to ensure the Private Key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.
WARNING: When generating new Keys, using a larger Bit Size will result in a longer key generation time. Tests on this hardware have shown it can take upwards of:
10 seconds for a 512 bit RSA Key
15 seconds for a 768 bit RSA Key
1 minute for a 1024 bit RSA key
1 minute for a 512 bit DSA Key
2 minutes for a 768 bit DSA Key
3 minutes for a 1024 bit DSA key
Note that some SSH Clients require RSA Host Keys to be at least 1024 bits in size.
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2. Enter or modify the fields in Table 11-1.

*Table 11-1 SSH Server Host Keys Fields*

| Field | Description |
|---|---|
| **Upload Keys** | ◆ **Private Key**—Enter the path and name of the existing private key you want to upload or use the **Browse** button to select the key. Be sure the private key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network<br>◆ **Public Key**—Enter the path and name of the existing public key you want to upload or use the **Browse** button to select the key.<br>◆ **Key Type**—Select a key type to use.<br>- **RSA**—Use this key with SSH1 and SSH2 protocols.<br>- **DSA**—Use this key with the SSH2 protocol. |

*Table 11-1 SSH Server Host Keys Fields (continued)*

| Field | Description |
|---|---|
| **Create New Keys** | ◆ **Key Type**—Select a key type to use for the new key. **RSA** = use this key with the SSH1 and SSH2 protocols. **DSA** = use this key with the SSH2 protocol.<br>◆ **Bit Size**—Select a bit length for the new key: 512, 768, 1024. Using a larger bit size takes more time to generate the key. Approximate times are:<br>- 10 seconds for a 512 bit RSA Key<br>- 15 seconds for a 768 bit RSA Key<br>- 1 minute for a 1024 bit RSA key<br>- 30 seconds for a 512 bit DSA key<br>- 1 minute for a 768 bit DSA key<br>- 2 minutes for a 1024 bit DSA key<br>***Note:*** *Some SSH clients require RSA host keys to be at least 1024 bits long.* |

3. Click **Submit**.

## SSH Server Authorized Users

You can change SSH server settings for Authorized Users which are accounts that enable access to the EDS1100/2100. For example, these SSH accounts can be used to log into the CLI or open an SSH connection to a device port. Every account must have a password.

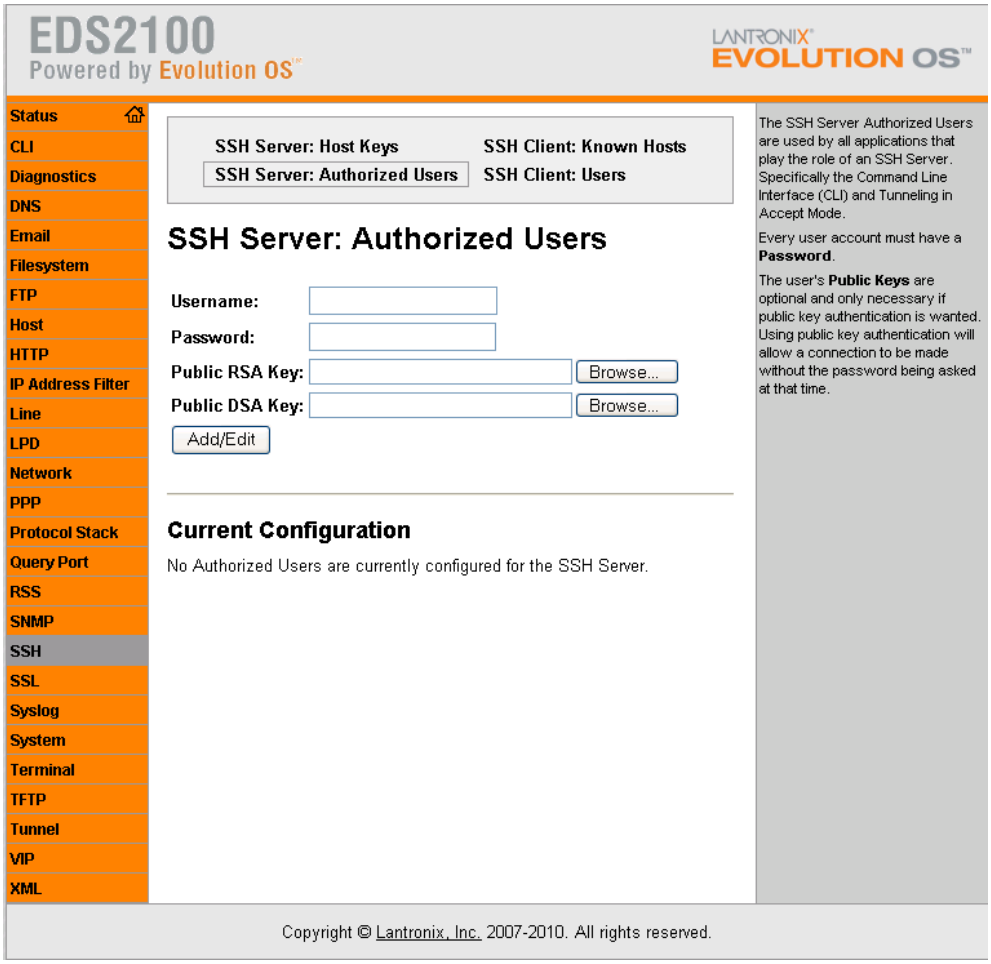
The public keys are optional and only necessary if public key authentication is required. Using public key authentication allows a connection to be made without a password.

Under Current Configuration, User has a Delete User link, and Public RSA Key and Public DSA Key have View Key and Delete Keylinks. If you click a Delete link, a message asks whether you are sure you want to delete this information. Click OK to proceed or Cancel to cancel the operation.

To configure the SSH server for authorized users, perform the following steps.

1. Click **SSH > Server Authorized Users**. Figure 11-2 shows the page that displays.

*Figure 11-2 SSH Server Authorized Users Web Page*




2. Enter or modify the fields in Table 11-2.

*Table 11-2 SSH Server Authorized Users Fields*

| Field | Description |
|---|---|
| **Username** | Enter the name of the user authorized to access the SSH server. |
| **Password** | Enter the password associated with the username. |
| **Public RSA Key** | Enter the path and name of the existing public RSA key you want to use with this user or use the **Browse** button to select the key. If authentication is successful with the key, no password is required. |
| **Public DSA Key** | Enter the path and name of the existing public DSA key you want to use with this user or use the **Browse** button to select the key. If authentication is successful with the key, no password is required. |

3. Click **Submit**.

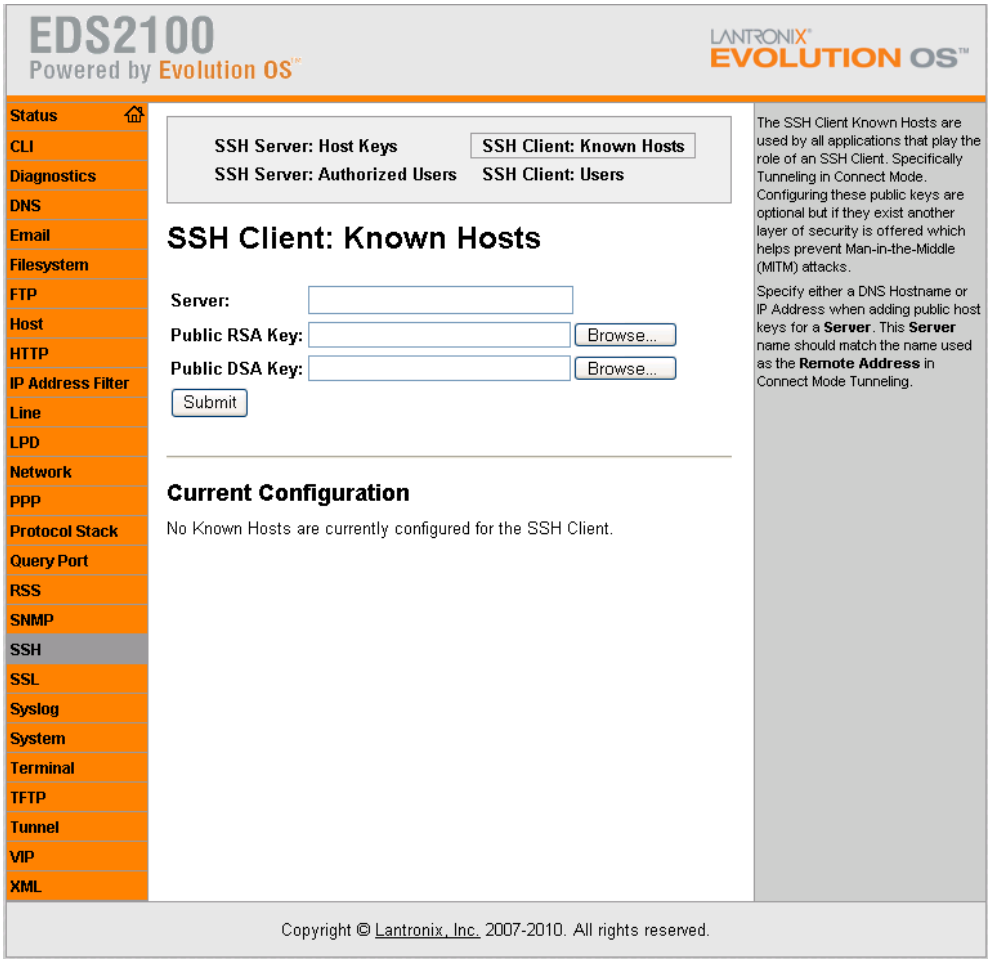
# SSH Client Known Hosts

You can change SSH client settings for known hosts. You do not have to complete the fields on this page for communication to occur. However, adding information in the fields adds another layer of security that protects against Man-In-The-Middle (MITM) attacks.

To configure the SSH client for known hosts, perform the following steps.

1. Click **SSH > Client Known Hosts**. Figure 11-3 shows the page that displays.

***Figure 11-3 SSH Client Known Hosts Web Page***




2. Enter or modify the fields in Table 11-3.

***Table 11-3 SSH Client Known Hosts Fields***

| Field | Description |
|---|---|
| **Server** | Enter the name or IP address of a known host. If you enter a server name, the name should match the name of the server used as the **Remote Address** in Connect mode tunneling. |
| **Public RSA Key** | Enter the path and name of the existing public RSA key you want to use with this known host or use the **Browse** button to select the key. |

*Table 11-3 SSH Client Known Hosts Fields (continued)*

| | |
|---|---|
| **Public DSA Key** | Enter the path and name of the existing public DSA key you want to use with this known host or use the **Browse** button to select the key. |

3. Click **Submit.**

***Note:*** *You can delete stored settings when the [**Delete**] link displays in the **Current Configuration** table.*

# SSH Client User Configuration

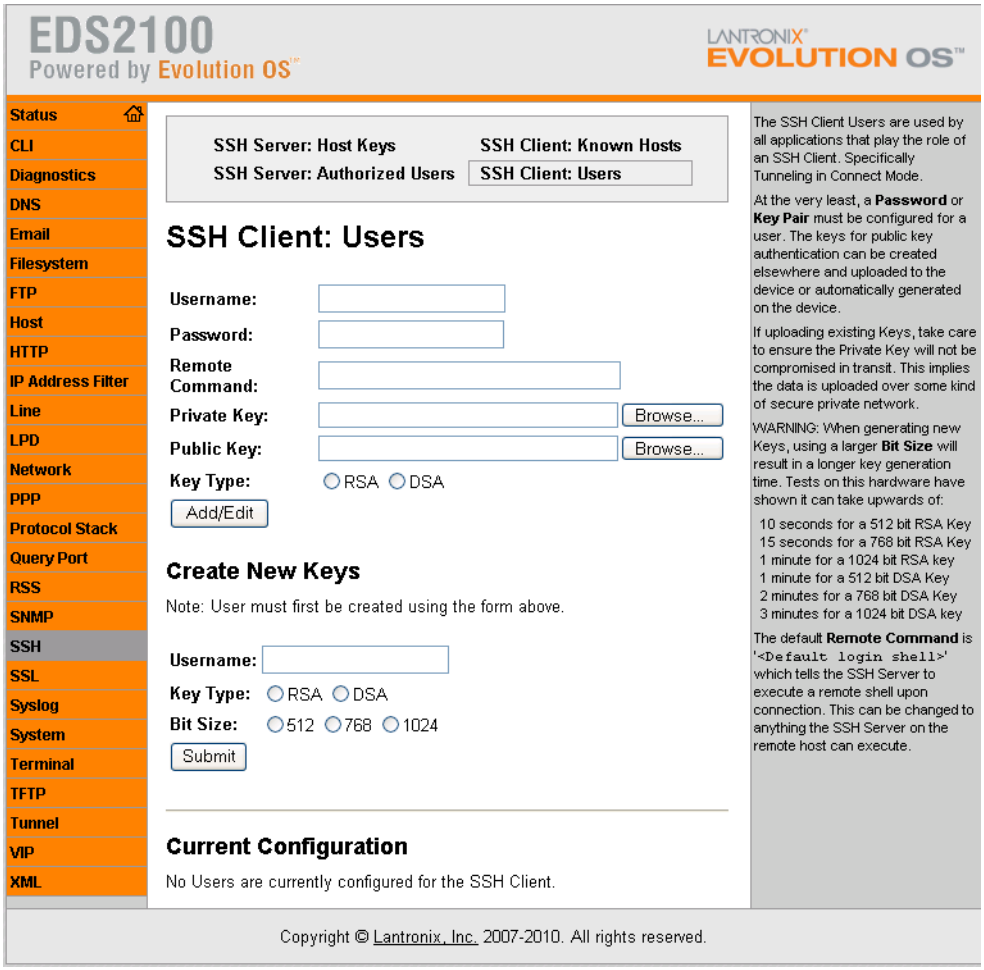
You can configure SSH client settings for users. SSH client known users are used by all applications that play the role of an SSH client, specifically tunneling in Connect Mode. Minimumally, a password or key pair must be configured for a user.

The keys for public key authentication can be created on another device and uploaded to the EDS1100/2100 or automatically generated on the EDS1100/2100. If uploading existing keys, be sure the private key does not get compromised in transit. Upload the data over a secure private network. If you are uploading a key, ensure that it is not password protected.

To configure the SSH client users, perform the following steps.

1. Click **SSH > SSH Client Users**. Figure 11-4 shows the page that displays.

*Figure 11-4 SSH Client Users Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
SSH Server: Host Keys
SSH Client: Known Hosts
SSH Server: Authorized Users
SSH Client: Users
SSH Client: Users
Username:
Password:
Remote Command:
Private Key:
Browse...
Public Key:
Browse...
Key Type:
RSA
DSA
Add/Edit
Create New Keys
Note: User must first be created using the form above.
Username:
Key Type:
RSA
DSA
Bit Size:
512
768
1024
Submit
Current Configuration
No Users are currently configured for the SSH Client.
The SSH Client Users are used by all applications that play the role of an SSH Client. Specifically Tunneling in Connect Mode.
At the very least, a Password or Key Pair must be configured for a user. The keys for public key authentication can be created elsewhere and uploaded to the device or automatically generated on the device.
If uploading existing Keys, take care to ensure the Private Key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.
WARNING: When generating new Keys, using a larger Bit Size will result in a longer key generation time. Tests on this hardware have shown it can take upwards of:
10 seconds for a 512 bit RSA Key
15 seconds for a 768 bit RSA Key
1 minute for a 1024 bit RSA key
1 minute for a 512 bit DSA Key
2 minutes for a 768 bit DSA Key
3 minutes for a 1024 bit DSA key
The default Remote Command is '<Default login shell>' which tells the SSH Server to execute a remote shell upon connection. This can be changed to anything the SSH Server on the remote host can execute.
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2. Enter or modify the fields in Table 11-4.

*Table 11-4 SSH Client Users Fields*

| Field | Description |
|---|---|
| **Username** | Enter the name that the EDS1100/2100 uses to connect to a SSH server. |
| **Password** | Enter the password associated with the username. |
| **Remote Command** | Enter the command that can be executed remotely. Default is **shell**, which tells the SSH server to execute a remote shell upon connection. This command can be changed to anything the remote host can perform. |
| **Private Key** | Enter the name of the existing private key you want to use with this SSH client user. You can either enter the path and name of the key, or use the **Browse** button to select the key. |
| **Public Key** | Enter the path and name of the existing public key you want to use with this SSH client user or use the **Browse** button to select the key. |
| **Key Type** | Select the key type to be used. Choices are:<br>◆ **RSA**—Use this key with the SSH1 and SSH2 protocols.<br>◆ **DSA**—Use this key with the SSH2 protocol. |

*Table 11-4 SSH Client Users Fields (continued)*

| Field | Description |
|---|---|
| **Create New Keys** | **Username**—Enter the name of the user associated with the new key.<br>**Key Type**—Select the key type to be used for the new key. Choices are:<br>◆ **RSA**—Use this key with the SSH1 and SSH2 protocols.<br>◆ **DSA**—Use this key with the SSH2 protocol.<br>◆ Bit Size—Select the bit length of the new key:<br>- 512<br>- 768<br>- 1024<br>***Note:*** *Using a larger Bit Size takes more time to generate the key. Approximate times are:*<br>◆ 10 seconds for a 512 bit RSA Key<br>◆ 15 seconds for a 768 bit RSA Key<br>◆ 1 minute for a 1024 bit RSA key<br>◆ 30 seconds for a 512 bit DSA key<br>◆ 1 minute for a 768 bit DSA key<br>◆ 2 minutes for a 1024 bit DSA key<br>***Note:*** *Some SSH clients require RSA host keys to be at least 1024 bits long.* |

3. Click **Submit**.

***Note:*** *You can delete stored settings when the [**Delete**] link displays in the **Current Configuration** table.*

# SSL Cipher Suites

The SSL standard defines only certain combinations of certificate type, key exchange method, symmetric encryption, and hash method. Such a combination is called a cipher suite. Table 11-1 lists the supported cipher suites.

*Table 11-1 Supported Cipher Suites*

| Certificate | Key Exchange | Encryption | Hash |
|---|---|---|---|
| DSA | DHE | 3DES | SHA1 |
| RSA | RSA | 128 bits AES | SHA1 |
| RSA | RSA | Triple DES | SHA1 |
| RSA | RSA | 128 bits RC4 | MD5 |
| RSA | RSA | 128 bits RC4 | SHA1 |
| RSA | 1024 bits RSA | 56 bits RC4 | MD5 |
| RSA | 1024 bits RSA | 56 bits RC4 | SHA1 |
| RSA | 1024 bits RSA | 40 bits RC4 | MD5 |

Whichever side is acting as server decides which cipher suite to use for a connection. It is usually the strongest common denominator of the cipher suite lists supported by both sides.

## SSL Certificates

The goal of a certificate is to authenticate its sender. It is analogous to a paper document that contains personal identification information and is signed by an authority, for example a notary or government agency.

The principles of Security Certificate required that in order to sign other certificates, the authority uses a private key. The published authority certificate contains the matching public key that allows another to verify the signature but not recreate it.

The authority's certificate can be signed by itself, resulting in a self-signed or trusted-root certificate, or by another (higher) authority, resulting in an intermediate authority certificate. You can build up a chain of intermediate authority certificates, and the last certification will always be a trusted-root certificate.

An authority that signs another certificates is also called a Certificate Authority (CA). The last in line is then the root-CA. VeriSign is a famous example of such a root-CA. Its certificate is often built into web browsers to allow verifying the identity of website servers, which need to have certificates signed by VeriSign or another public CA. Since obtaining a certificate signed by a CA that is managed by another company can be expensive, it is possible to have your own CA. Tools exist to generate self-signed CA certificates or to sign other certificates.

A certificate request is a certificate that has not been signed and only contains the identifying information. Signing it makes it a certificate. A certificate is also used to sign any message transmitted to the peer to identify the originator and prevent tampering while transported.

When using HTTPS, SSL Tunneling in Accept mode, and/or EAP-TLS, the EDS1100/2100 needs a personal certificate with a matching private key to identify itself and sign its messages. When using SSL Tunneling in Connect mode and/or EAP-TLS, EAP-TTLS or PEAP, the EDS1100/2100 needs the authority certificate that can authenticate users with which it wishes to communicate.

## SSL RSA or DSA

As mentioned above, the certificates contain a public key. Different key exchange methods require different public keys and thus different styles of certificate. The EDS1100/2100 supports key exchange methods that require a RSA-style certificate and key exchange methods that require a DSA-style certificate. If only one of these certificates is stored in the EDS1100/2100, only those key exchange methods that can work with that style certificate are enabled. RSA is sufficient in most cases.

## SSL Certificates and Private Keys

You can obtain a certificate by completing a certificate request and sending it to a certificate authority that will create a certificate/key combo, usually for a fee. Or generate your own. A few utilities exist to generate self-signed certificates or sign certificate requests. The EDS1100/2100 also has the ability to generate its own self-signed certificate/key combo.

You can use XML to export the certificate in PEM format, but you cannot export the key. Hence the internal certificate generator can only be used for certificates that are to identify that particular EDS1100/2100.

Certificates and private keys can be stored in several file formats. Best known are PKCS12, DER and PEM. Certificate and key can be in the same file or in separate files. The key can be encrypted with a password or not. The EDS1100/2100 currently only accepts separate PEM files. The key needs to be unencrypted.

## SSL Utilities

Several utilities exist to convert between the formats as follows:

- OpenSSL—Open source set of SSL related command line utilities. It can act as server or client. It can generate or sign certificate requests. It can convert all kinds of formats. Executables are available for Linux and Windows. To generate a self-signed RSA certificate/key combo use the following commands in the order shown:

  ```
  openssl req –x509 –nodes –days 365 –newkey rsa:1024 –keyout
  mp_key.pem –out mp_cert.pem
  ```

***Note:*** *Signing other certificate requests is also possible with OpenSSL. See www.openssl.org or www.madboa.com/geek/openssl for more information.*

- Steel Belted Radius—Commercial radius server by Juniper Networks that provides a GUI administration interface. It also provides a certificate request and self-signed certificate generator. The self-signed certificate has extension .sbrpvk and is in the PKCS12 format. OpenSSL can convert this into a PEM format certificate and key by usig the following commands in the order shown:

  ```
  openssl pkcs12 -in sbr_certkey.sbrpvk -nodes -out sbr_certkey.pem
  ```

  The sbr_certkey.pem file contains both certificate and key. If loading the SBR certificate into EDS1100/2100 as an authority, you will need to edit it. Open the file in any plain text editor. Delete all info before the following:

  "----- BEGIN CERTIFICATE-----"

  and after

  "----- END CERTIFICATE-----"

  and save as sbr_cert.pem. SBR accepts trusted-root certificates in the DER format. Again, OpenSSL can convert any format into DER by using the following commands in the order shown:

  ```
  openssl x509 -inform pem -in mp_cert.pem -outform der -out mp_cert.der
  ```

***Note:*** *With SBR, when the identity information includes special characters such as dashes and periods, SBR changes the format it uses to store these strings and becomes incompatible with the current EDS1100/2100 release. We will add support for this and other formats in future releases.*

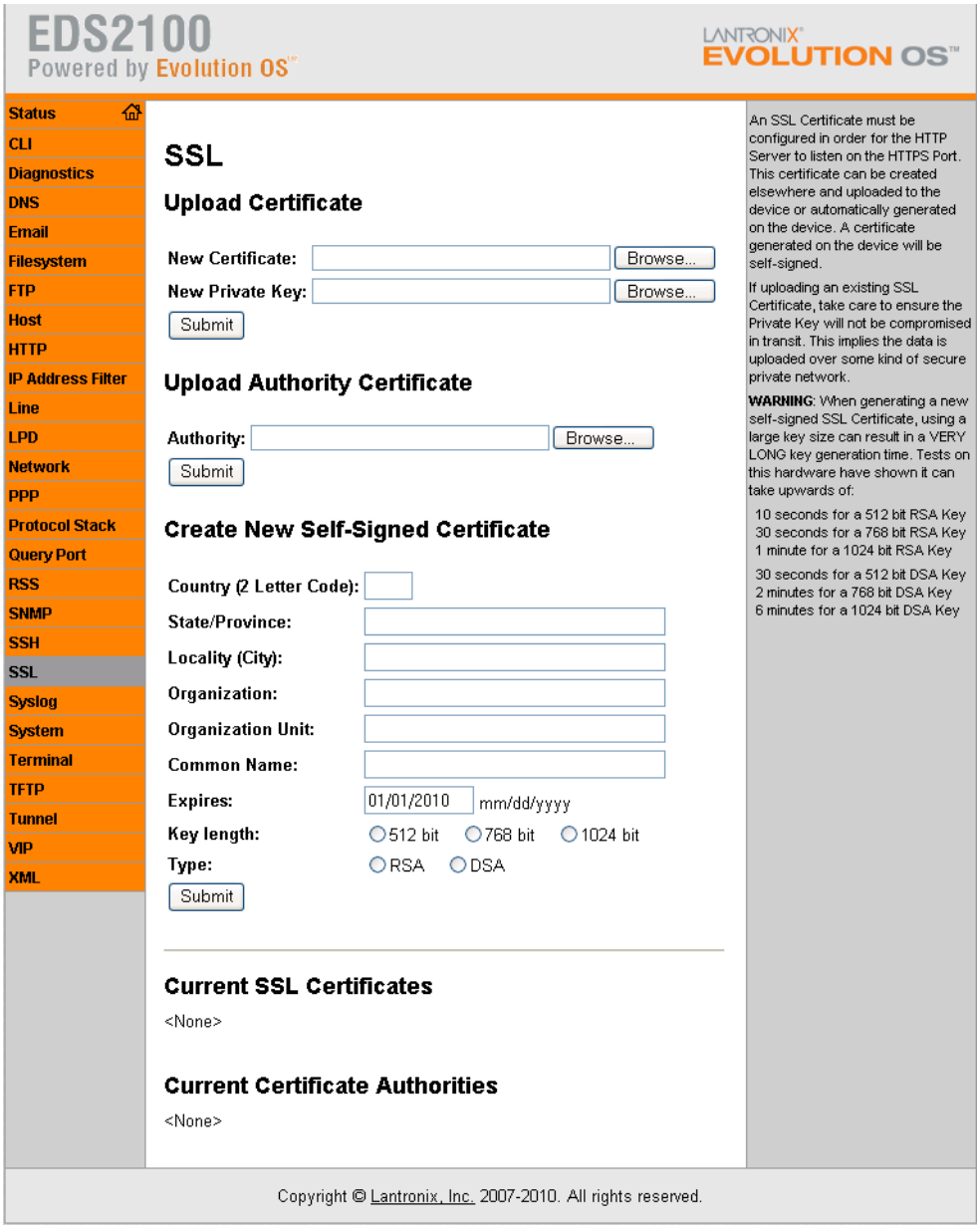
- Free Radius—Linux open-source Radius server. It is versatile, but complicated to configure.

## SSL Configuration

To configure SSL, perform the following steps.

1. Click **SSL** from the Main Menu. Figure 11-5 shows the page that displays.

*Figure 11-5 SSL Web Page*



2. Enter or modify the fields in Table 11-5.

***Table 11-5 SSL Fields***

| Field | Description |
|---|---|
| **Upload Certificate** | **New Certificate**—This certificate identifies the EDS1100/2100 to peers. It is used for HTTPS and SSL Tunneling. Enter the path and name of the certificate you want to upload, or use the **Browse** button to select the certificate. RSA or DSA certificates with 512 to 1024 bit public keys are allowed.<br>***Note:*** *The file format must be PEM. The file must start with "-----BEGIN CERTIFICATE-----" and end with "-----END CERTIFICATE-----". Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.*<br>**New Private Key**—Enter the path and name of the private key you want to upload, or use the Browse button to select the private key. The key needs to belong to the certificate entered above.<br>***Note:*** *The format of the file must be PEM. The file must start with "-----BEGIN RSA PRIVATE KEY-----" and end with "-----END RSA PRIVATE KEY-----". Read DSA instead of RSA in case of a DSA key. Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.* |
| **Upload Authority Certificate** | **Authority**—One or more authority certificates are needed to verify a peer's identity. It is used for SSL Tunneling. These certificates do not require a private key. Enter the path and name of the certificate you want to upload, or use the Browse button to select the certificate. RSA or DSA certificates with 512 to 1024 bit public keys are allowed.<br>***Note:*** *The format of the file must be PEM. The file must start with "-----BEGIN CERTIFICATE-----" and end with "-----END CERTIFICATE-----". Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.* |
| **Create New Self-Signed Certificate** | **Country** (2 Letter Code)—Enter the 2-letter country code to be assigned to the new self-signed certificate. Examples: US for United States and CA for Canada<br>**State/Province**—Enter the state or province to be assigned to the new self-signed certificate.<br>**Locality** (City)—Enter the city or locality to be assigned to the new self-signed certificate.<br>**Organization**—Enter the organization to be associated with the new self-signed certificate. Example: If your company is called Widgets, and you are setting up a web server for the Sales department, enter Widgets for the organization.<br>**Organization Unit**—Enter the organizational unit to be associated with the new self-signed certificate. Example: If your company is setting up a web server for the Sales department, enter Sales for your organizational unit. |

*Table 11-5 SSL Fields (continued)*

| Field | Description |
|---|---|
| | **Expires**—Enter the expiration date, in mm/dd/yyyy format, for the new self-signed certificate. Example: An expiration date of May 9, 2010 is entered as 05/09/2010.<br>**Key Length**—Select the bit size of the new self-signed certificate. Choices are:<br>◆ 512 bits<br>◆ 768 bits<br>◆ 1024 bits<br>The larger the bit size, the longer it takes to generate the key. Approximate times are:<br>◆ 10 seconds for a 512-bit RSA key<br>◆ 30 seconds for a 768-bit RSA key<br>◆ 1 minute for a 1024-bit RSA key<br>◆ 30 seconds for a 512-bit DSA key<br>◆ 2 minutes for a 768-bit DSA key<br>◆ 6 minute for a 1024-bit DSA key<br>**Type**—Select the type of key:<br>◆ **RSA**—Public-Key Cryptography algorithm based on large prime numbers, invented by Rivest Shamir and Adleman. Used for encryption and signing.<br>◆ **DSA**—Digital Signature Algorithm also based on large prime numbers, but can only be used for signing. Developed by the US government to avoid the patents on RSA. |

# 12: VIP

VIP (Virtual IP) takes advantage of the Lantronix ManageLinx technology that solves the access-through-firewall problem. ManageLinx utilizes existing network infrastructure to create a virtual device network (VDN).

VDN provides direct access to only authorized equipment, behind firewalls, from anywhere via the net. The VDN technology enables you to create dedicated TCP/IP connections between any two devices, using easily deployed hardware appliances. There is no client software to install. No changes are required to network software or applications at either end of the connection.

ManageLinx is a secure and totally transparent remote access solution. The VDN hardware consists of a publicly accessible Device Services Manager (DSM) and individual Device Services Controller (DSC) appliances in multiple locations. Together, these two components enable you to set up and manage individual Virtual IP (VIP) addresses and routes.

The EDS1100/2100 with VIP enabled takes the place of a DSC and provides direct access to your equipment.

The EDS1100/2100 supports both Accept and Connect Mode tunneling through VIPs. Configuring an EDS1100/2100 to use VIP Access involves:

- Obtaining a ManageLinx XML bootstrap file
- Importing the ManageLinx XML bootstrap file
- Enabling VIP access
- Configuring your tunnels to use the VIPs

Once the EDS1100/2100 is configured and enabled to use VIPs, it will immediately attempt to establish a conduit with the ManageLinx DSM. Once the conduit is up, tunneling via VIP Access is ready to go.

This chapter contains the following sections:


- Obtain a Bootstrap File
- Import the Bootstrap File
- Enable VIP
- Configure Tunnels to Use VIP
- VIP Statistics
- VIP Configuration


## Obtain a Bootstrap File

The ManageLinx XML bootstrap file is an XML file that contains the information required to contact and authenticate to a DSM. This file must be generated and sent to you by the DSM administrator. See the ManageLinx documentation for more details.

## Import the Bootstrap File

To configure an EDS1100/2100 to use VIP Access, import the bootstrap file as you would any XML Configuration Record (XCR). For instructions on importing XCRs, see Chapter 14: Advanced Settings.

## Enable VIP

Once the bootstrap file has been imported, VIP Access can be enabled and a conduit with the DSM will be established. The VIP Statistics shows the current state of the conduit. When configured correctly, a conduit with the DSM will be maintained at all times.

## Configure Tunnels to Use VIP

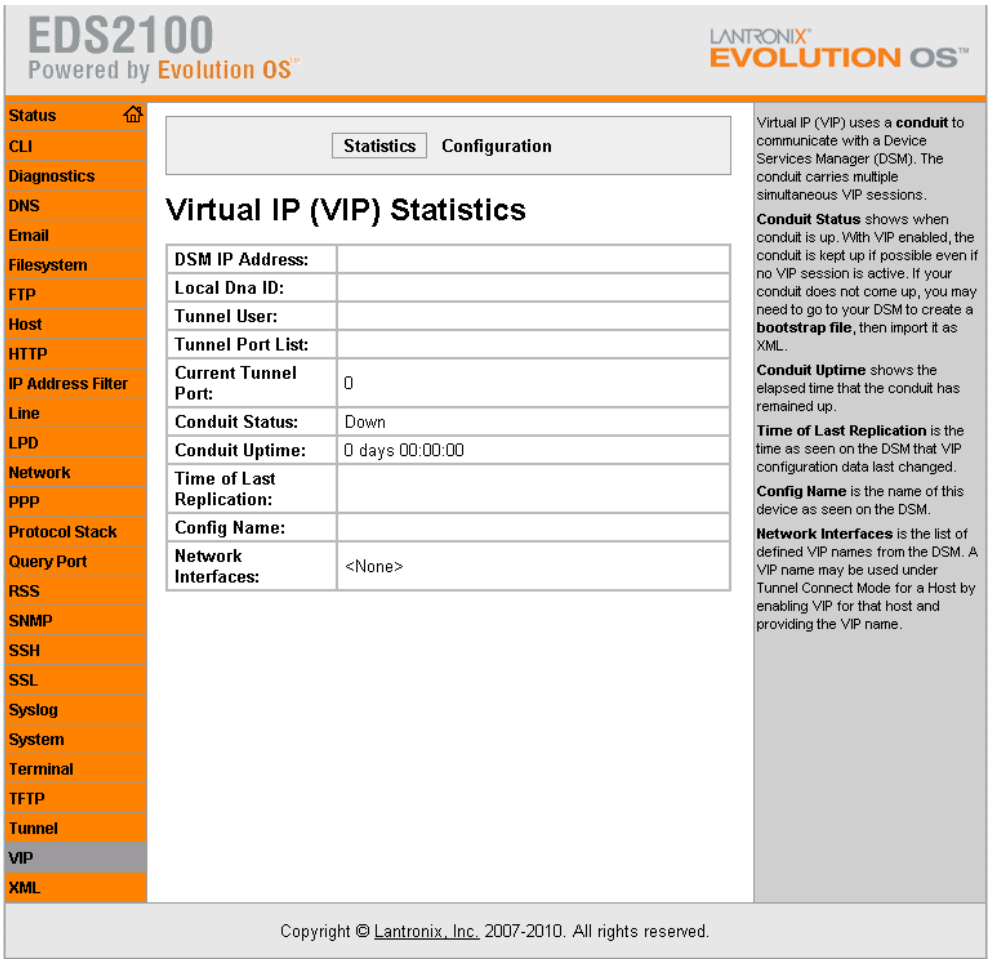
Configuring Connect Mode tunnels to use VIP is a simple matter of configuring a tunnel as is normally done, but also enabling VIP in the Tunnel Host settings, and using a VIP Name for the address. VIP Accept Mode tunnels do not require special configuration. If VIP access is enabled (in the VIP configuration page), then VIP Accept Mode requests from a ManageLinx device will be accepted.

## VIP Statistics

To view the VIP statistics, perform the following steps.

1. Click **VIP** from the Main Menu. Figure 12-1 shows the page that displays.

***Figure 12-1 VIP Statistics Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Statistics
Configuration
Virtual IP (VIP) Statistics
DSM IP Address:
Local Dna ID:
Tunnel User:
Tunnel Port List:
Current Tunnel Port: 0
Conduit Status: Down
Conduit Uptime: 0 days 00:00:00
Time of Last Replication:
Config Name:
Network Interfaces: <None>
Virtual IP (VIP) uses a conduit to communicate with a Device Services Manager (DSM). The conduit carries multiple simultaneous VIP sessions.
Conduit Status shows when conduit is up. With VIP enabled, the conduit is kept up if possible even if no VIP session is active. If your conduit does not come up, you may need to go to your DSM to create a bootstrap file, then import it as XML.
Conduit Uptime shows the elapsed time that the conduit has remained up.
Time of Last Replication is the time as seen on the DSM that VIP configuration data last changed.
Config Name is the name of this device as seen on the DSM.
Network Interfaces is the list of defined VIP names from the DSM. A VIP name may be used under Tunnel Connect Mode for a Host by enabling VIP for that host and providing the VIP name.
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2. Enter or modify the fields in Table 12-1.

***Table 12-1 VIP Statistics Fields***

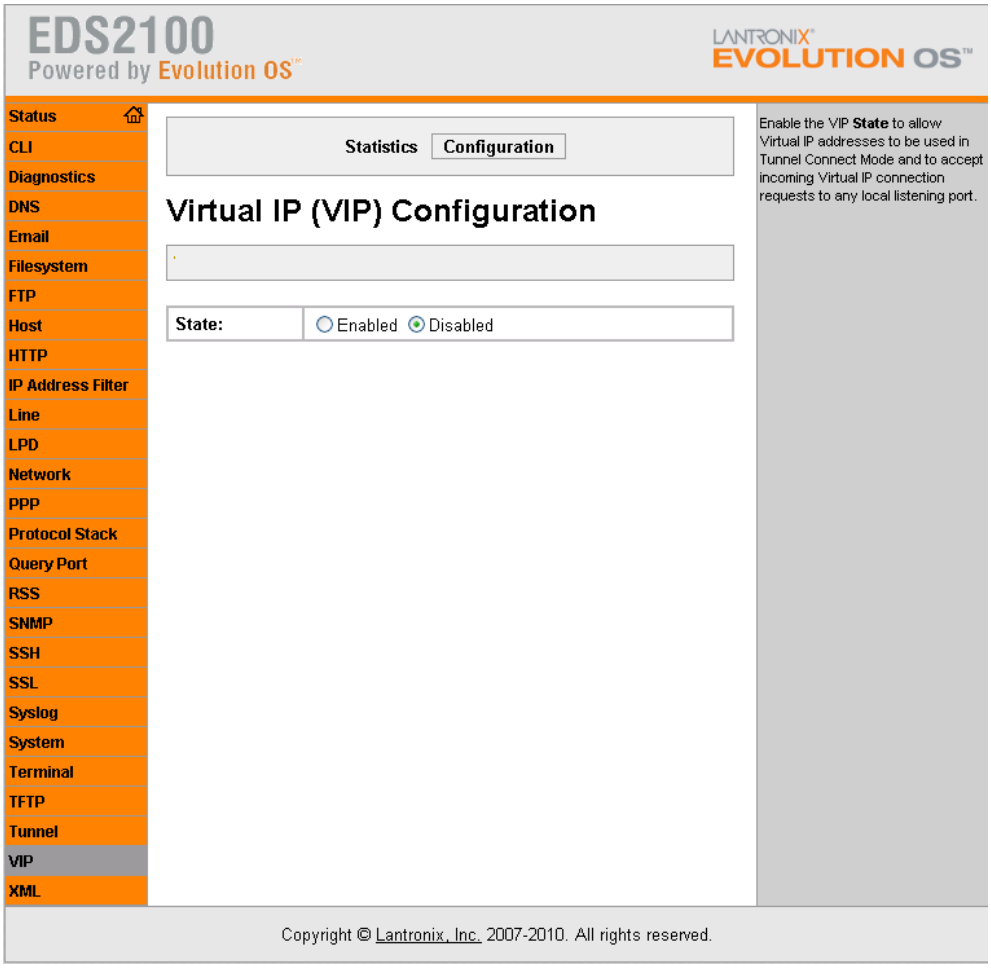
| Field | Description |
|---|---|
| **DSM IP Address** | Address of the Device Services Manager (DSM) from the bootstrap file. |
| **Local DNA ID** | Identity of this device from the bootstrap file. |
| **Tunnel User** | username of this device from the bootstrap file. |
| **Tunnel Port List** | DSM listening ports from the bootstrap file. |
| **Current Tunnel Port** | DSM port currently used by the conduit. |
| **Conduit Status** | Indicates the status of the secure communications channel to the ManageLinx DSM. |
| **Conduit Uptime** | Amount of time the XPort has had conduit established. |
| **Time of Last Replication** | Time and date when configuration information was last received from a ManageLinx DSM. |
| **Config Name** | The name used by the ManageLinx DSM to identifies the EDS1100/2100. |
| **Network Interfaces** | VIPs that can be used in Connect Mode VIP tunnels. |

# VIP Configuration

To configure VIP, perform the following steps.

1. Click **VIP > Configuration** from the Main Menu. Figure 12-2 shows the page that displays.

*Figure 12-2 VIP Configuration Web Page*




2. Click **Enabled** to use VIP addresses in Tunnel Accept Mode and Tunnel Connect Mode. The default is disabled.
3. Click **Submit**.

# 13: Maintenance and Diagnostics Settings

This chapter describes maintenance and diagnostic methods and contains the following sections:


- Filesystem
- Protocol Stack
- IP Address Filter
- Query Port
- Diagnostics
- System


## Filesystem

The EDS1100/2100 uses a flash filesystem to store files. You can view file diagnostics and/or modify files. There are two subsections: Statistics and Browse.

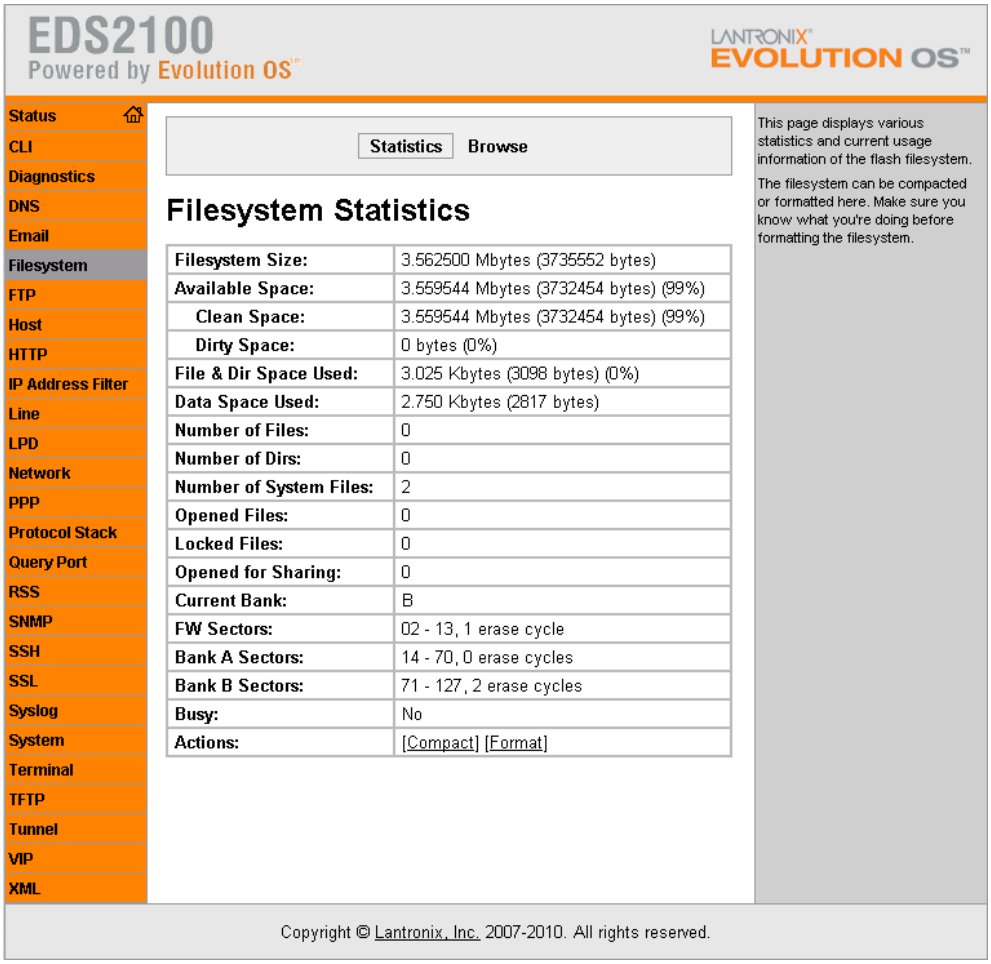
The Statistics section of the Filesystem Statistics window shows current statistics and usage information of the flash file system. In the FileSystem Browser section of the Filesystem Statistics web page,  you can create files and folders, upload files, copy and move files, and use TFTP.

### Filesystem Statistics and Actions

To display the filesystem statistics, compact, or format the filesystem, perform the following steps.

1. Click **Filesystem** on the Main Menu. Figure 13-1 shows the page that displays.

*Figure 13-1 Filesystem Statistics Web Page*




2. Click **Compact** in the **Actions** row to compact the files.

***Note:*** *The compact should not be needed under normal circumstances as the system manages this automatically.*

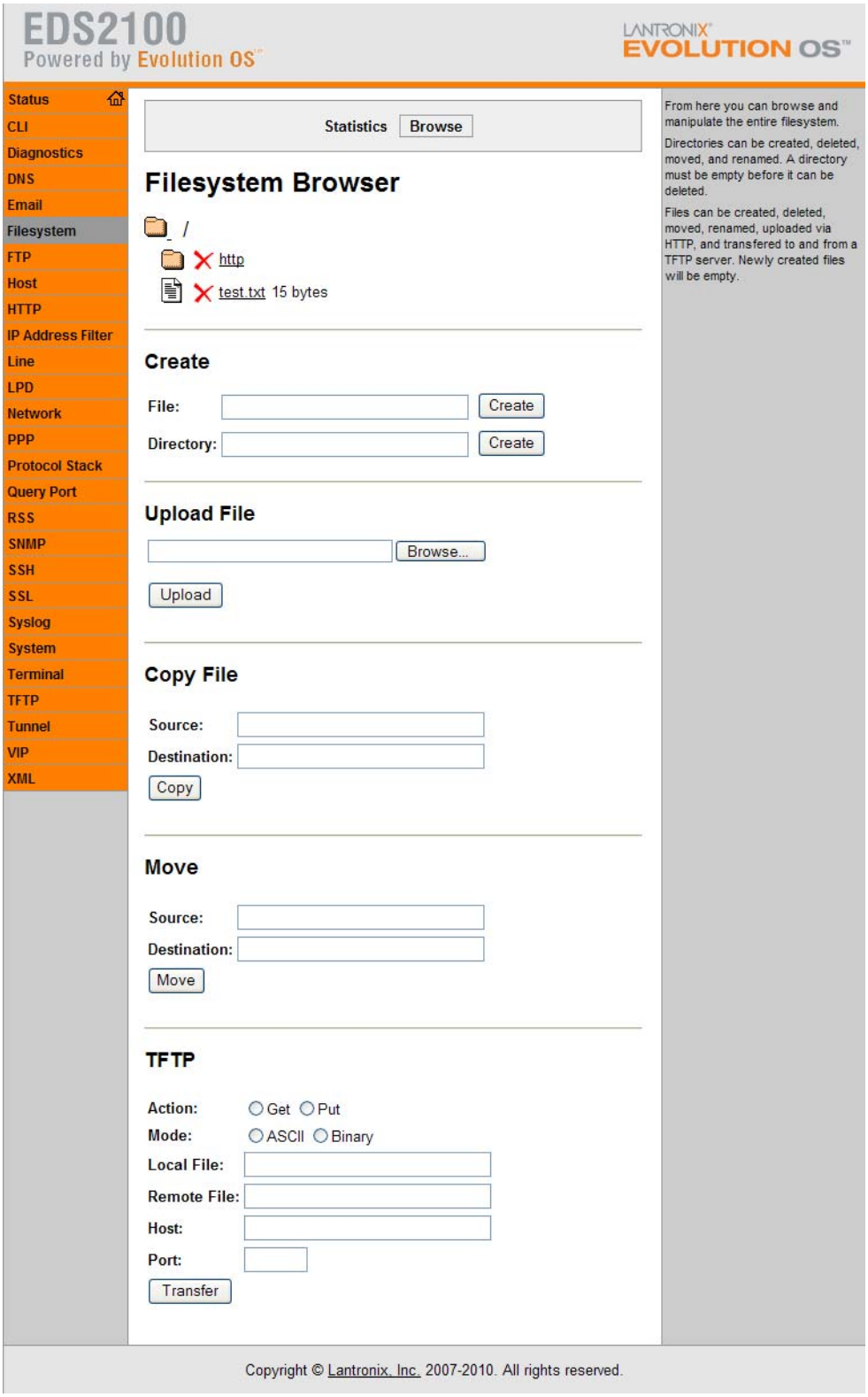
3. Back up all files before you perform Step 4, because all user files get erased in that step.
4. Cick **Format** in the Actions row. The configuration gets retained.

## Filesystem Browser

To browse the filesystem, perform the following steps.

1. Click **Filesystem > Browse**. Figure 13-2 shows the page that displays.

***Figure 13-2 Filesystem Browser Web Page***




2. Click a filename to view the contents.

3. Click the X next to a filename to delete the file and then you can delete the directory. The directory has to be empty before you can delete it.

***Note:*** *Changes apply to the current directory view. To make changes within other folders, click the folder or directory and then enter the parameters in the settings listed in* Table 13-1.

Files can be copied or moved by using the fields noted in Table 13-1.

***Table 13-1 Filesystem Browser Fields***

| Field | Description |
|---|---|
| **Create** | |
| ◆ File | Enter the name of the file you want to create, and then click **Create**. |
| ◆ Directory | Enter the name of the directory you want to create, and then click **Create**. |
| **Upload File** | Enter the path and name of the file you want to upload by means of HTTP(S) or use the **Browse** button to select the file, and then click **Upload**. |
| **Copy File** | |
| ◆ Source | Enter the location where the file you want to copy resides. |
| ◆ Destination | Enter the location where you want the file copied.<br>After you specify a source and destination, click **Copy** to copy the file. |
| **Move** | |
| ◆ Source | Enter the location where the file you want to move resides. |
| ◆ Destination | Enter the location where you want the file moved.<br>After you specify a source and destination, click **Move** to move the file. |
| **TFTP** | |
| ◆ Action | Select the action that is to be performed via TFTP:<br>**Get**—A TFTP get command will be executed to store a file locally.<br>**Put**— A TFTP put command will be executed to send a file on the local file system to a remote location. |
| ◆ Mode | Select a TFTP mode to use. Choices are:<br>◆ ASCII<br>◆ Binary |
| ◆ Local File | Enter the name of the local file. |
| ◆ Remote File | Enter the name of the file at the remote location that is to be stored locally (get) or externally (put). |
| ◆ Host | Enter the IP address or name of the host involved in this operation. |
| ◆ Port | Enter the number of the port involved in TFTP operations on which the specified TFTP get or put command will be performed. Click **Transfer** to perform the TFTP transfer. |

# Protocol Stack

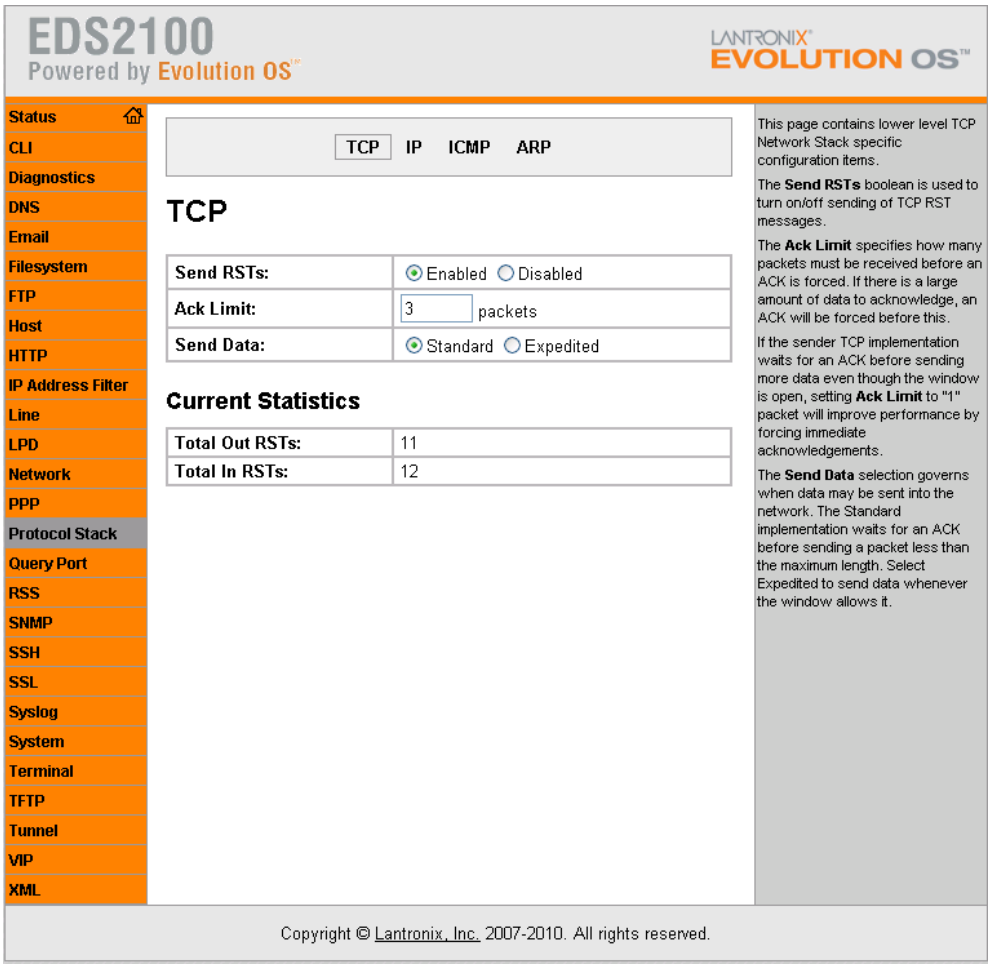
In the Protocol Stack web page, you can configure TCP, IP, ICMP, and ARP.

## TCP

To configure the network protocols, perform the following steps.

1. Click **Protocol Stack** on the Main Menu. TCP is the default. Figure 13-3 shows the page that displays.

***Figure 13-3 TCP Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
TCP IP ICMP ARP
TCP
Send RSTs: Enabled Disabled
Ack Limit: 3 packets
Send Data: Standard Expedited
Current Statistics
Total Out RSTs: 11
Total In RSTs: 12
This page contains lower level TCP Network Stack specific configuration items.
The Send RSTs boolean is used to turn on/off sending of TCP RST messages.
The Ack Limit specifies how many packets must be received before an ACK is forced. If there is a large amount of data to acknowledge, an ACK will be forced before this.
If the sender TCP implementation waits for an ACK before sending more data even though the window is open, setting Ack Limit to "1" packet will improve performance by forcing immediate acknowledgements.
The Send Data selection governs when data may be sent into the network. The Standard implementation waits for an ACK before sending a packet less than the maximum length. Select Expedited to send data whenever the window allows it.
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2. Enter or modify the fields in Table 13-2.

***Table 13-2 TCP Fields***

| Field | Description |
|---|---|
| **Send RSTs** | Click **Enabled** to send RSTs or **Disabled** to stop sending RSTs. TCP contains six control bits, with one or more defined in each packet. RST is one of the control bits. The RST bit is responsible for telling the receiving TCP stack to end a connection immediately.<br><br>***Caution: Setting the RSTs may pose a security risk.*** |

*Table 13-2 TCP Fields (continued)*

| Field | Description |
|---|---|
| **Ack Limit** | Enter a number to limit how many packets get received before an ACK gets forced. If there is a large amount of data to acknowledge, an ACK gets forced. If the sender TCP implementation waits for an ACK before sending more data even though the window is open, setting the **Ack Limit** to 1 packet improves performance by forcing immediate acknowledgements. |
| **Send Data** | The **Send Data** selection governs when data may be sent into the network. The Standard implementation waits for an ACK before sending a packet less than the maximum length. Select Expedited to send data whenever the window allows it. |

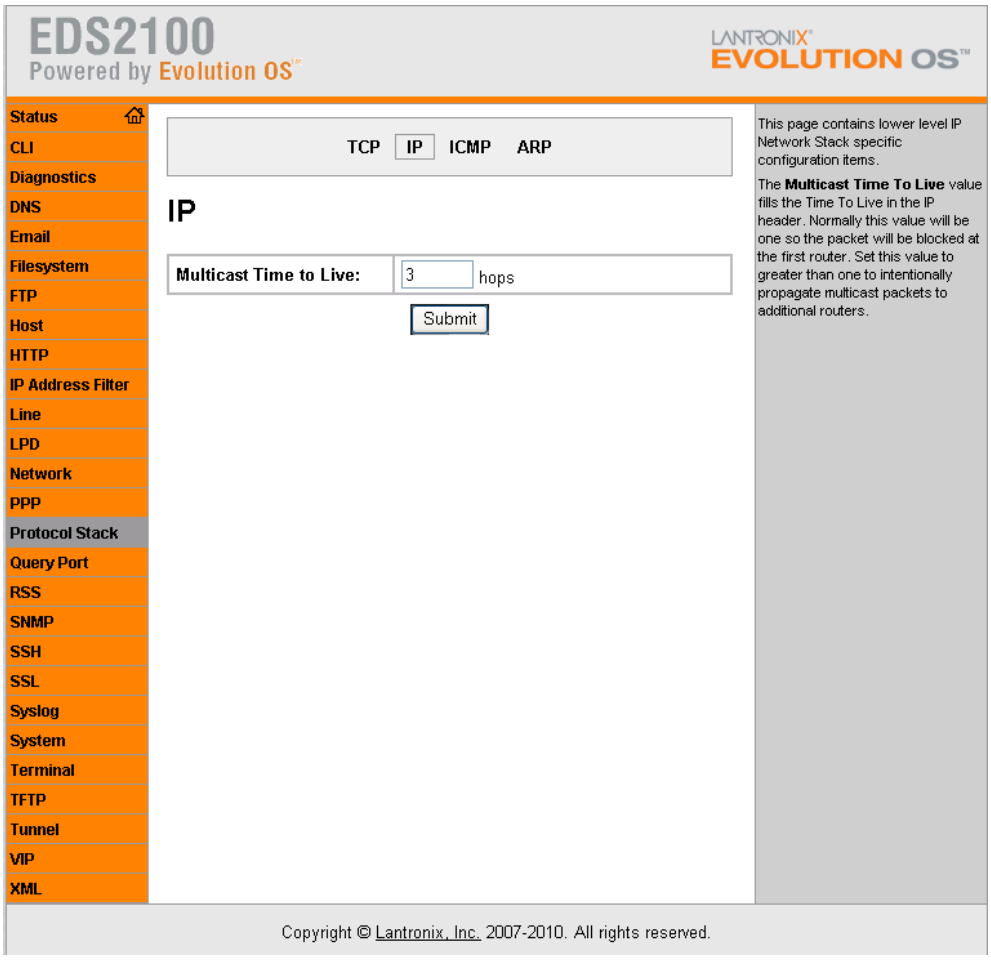
3. Click **Submit** .

## IP

To change the IP settings, perform the following steps.

1. Click **Protocol Stack > IP**. Figure 13-4 shows the page that displays.

*Figure 13-4 IP Web Page*




2. Enter the number of hops a multicast packet can complete before it is terminated as a Multicast Time to Live.

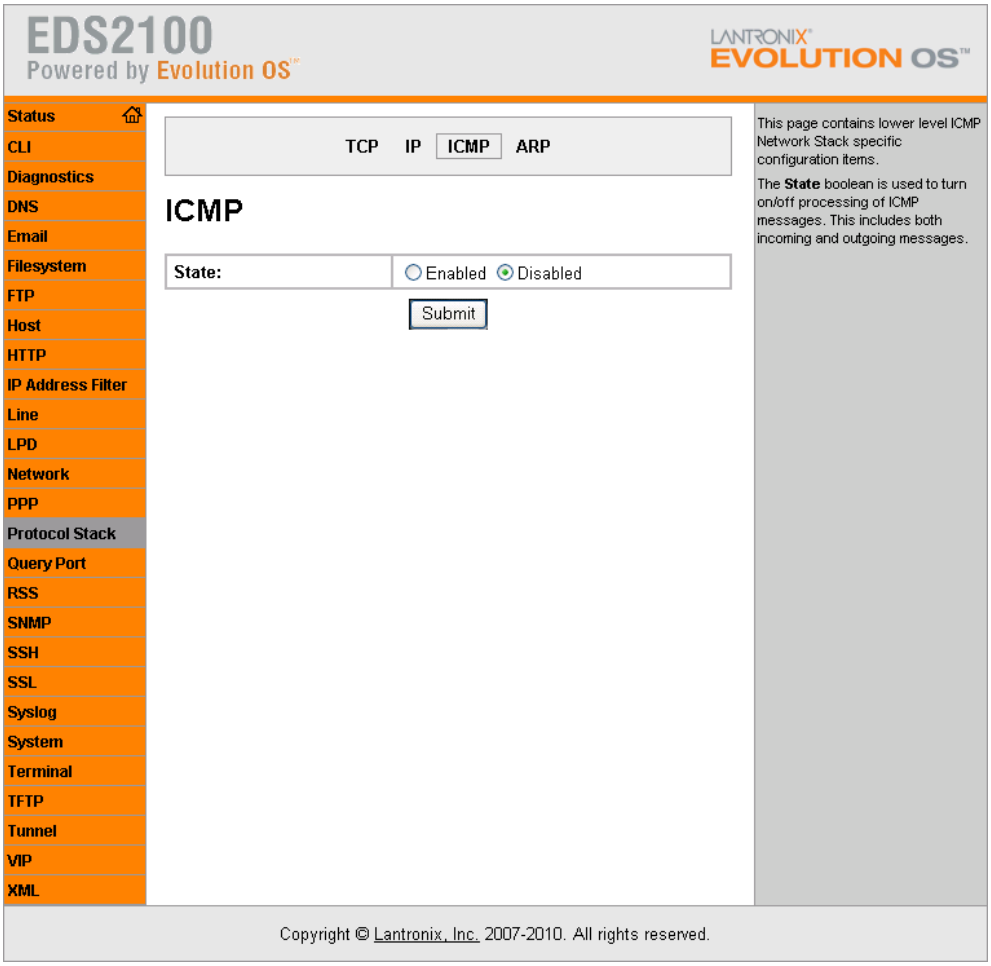
3. Click **Submit**.

## ICMP

To set the ICMP, perform the following steps.

1. Click **Protocol Stack < ICMP**. Figure 13-5 shows the page that displays.

***Figure 13-5 ICMP Web Page***

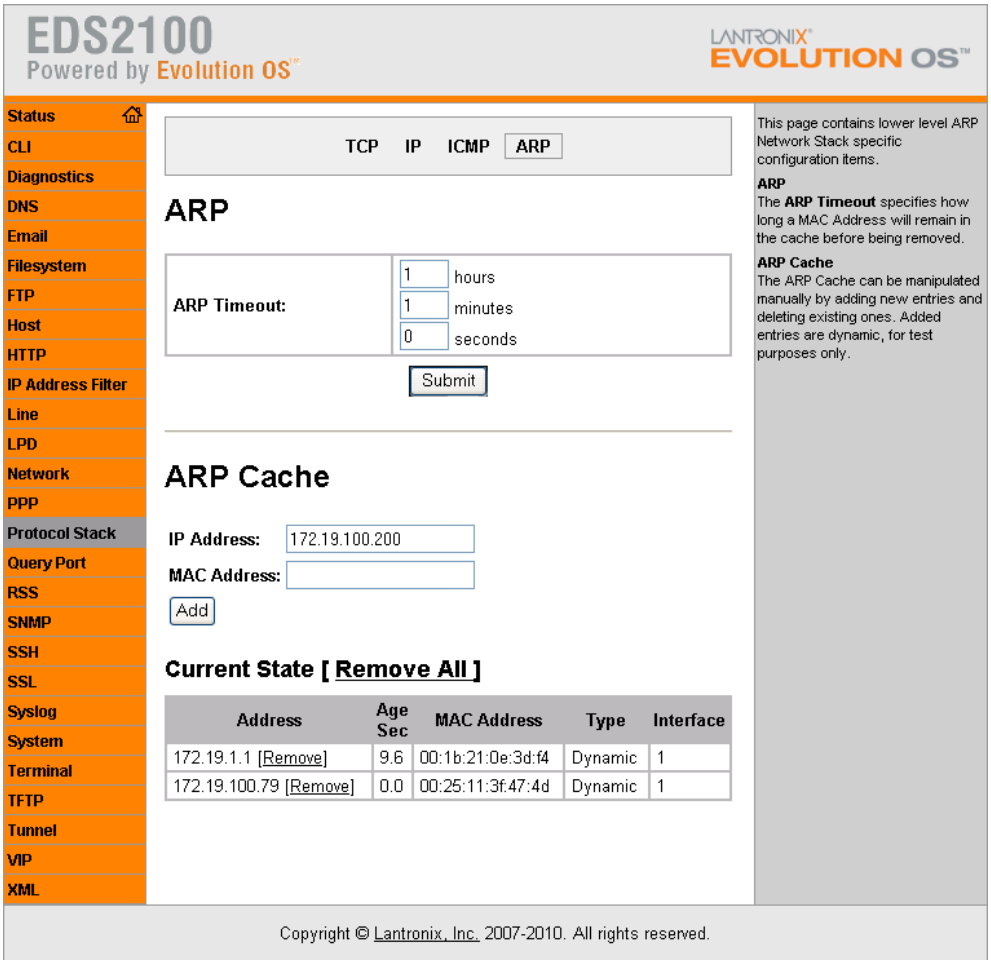



2. Click **Enabled**.
3. Click **Submit**.

## ARP

1. Click **Protocol Stack > ARP**. Figure 13-6 shows the page that displays.

*Figure 13-6 ARP Web Page*




1. Enter the fields in Table 13-3.

*Table 13-3 ARP Web Page Fields*

| Field | Description |
|---|---|
| **ARP Timeout** | Enter hours, minutes and seconds. This is the maximum duration an address remains in the cache. |
| **IP Address** | Enter the IP address for the ARP cache. |
| **MAC Address** | Enter the MAC address to add to the ARP cache. |
| **Current State [Remove All]** | Removes all entries in the ARP cache or click [**Remove**] in the specific table entry to remove that entry. |

2. Click **Submit** for ARP or click **Add** for ARP Cache.

***Note:*** *Both the IP and MAC addresses are required for the ARP cache.*

# IP Address Filter

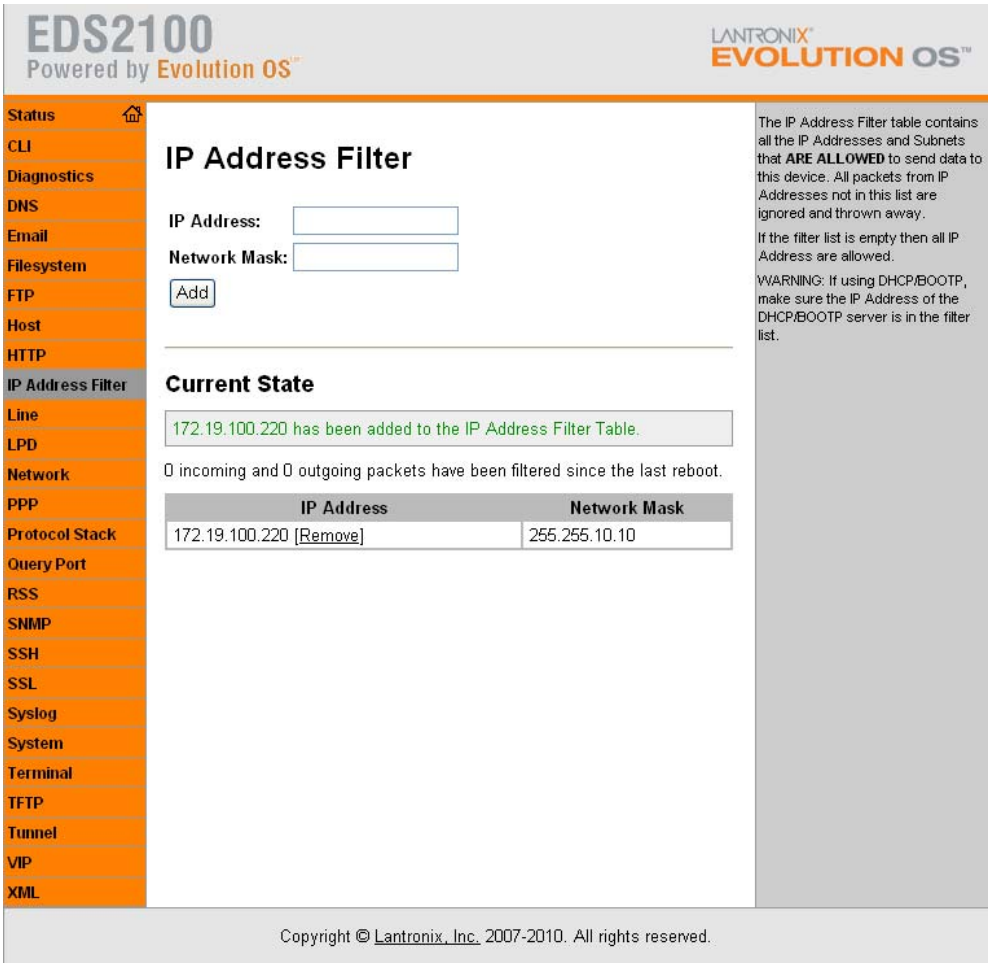
The IP address filter allows specified hosts and subnets to communicate with the EDS1100/2100.

***Note:*** *If using DHCP/BOOTP, ensure the DHCP/BOOTP server IP address is in the list.*

To configure the IP address filter, perform the following steps.

1. Click the **IP Address Filter** on the Main Menu. Figure 13-7 shows the page that displays.

***Figure 13-7 IP Address Filter Web Page***




***Note:*** *Be aware not to assign your network IP address as "filtered." You will have to reset your system because the EDS1100/2100 has locked your network out.*

2. Enter or modify the fields in Table 13-4

***Table 13-4 IP Address Filter Fields***

| Field | Description |
|---|---|
| **IP Address** | Enter the IP address to add to the IP filter table. |
| **Network Mask** | Enter the IP address' network mask in dotted notation. |

3. Click **Add**.

***Note:*** *You can remove IP addresses by clicking [**Remove**] in the **Current State** table.*

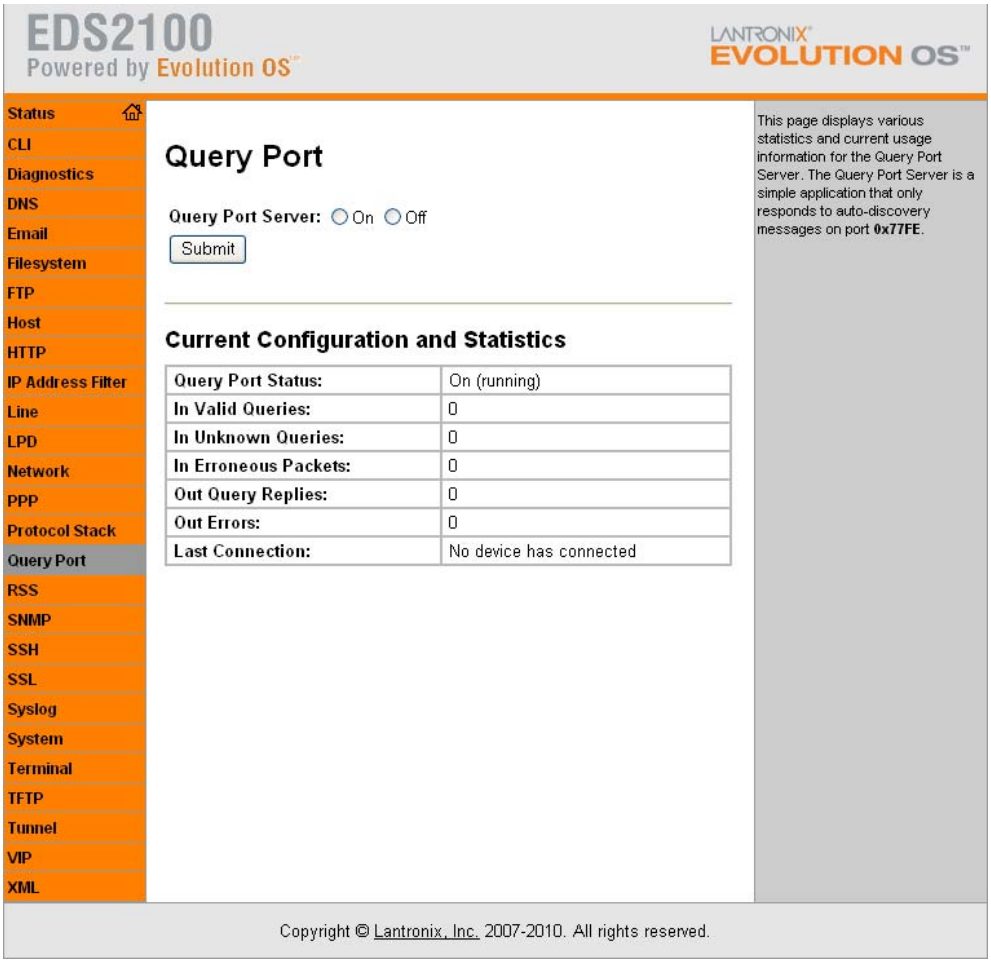
# Query Port

The query port (0x77FE) is used for the automatic discovery of the device by the DeviceInstaller utility. Only 0x77FE discover messages from DeviceInstaller are supported. For more information on DeviceInstaller, see 5: Using DeviceInstaller

To configure the query port server, perform the following steps.

1. Click **Query Port** on the Main Menu. Figure 13-8 shows the page that displays.

***Figure 13-8 Query Port Web Page***




1. Select **On**. Off is the default.
2. Click **Submit**.

# Diagnostics

The EDS1100/2100 has several tools to perform diagnostics and view device statistics. These include information on:

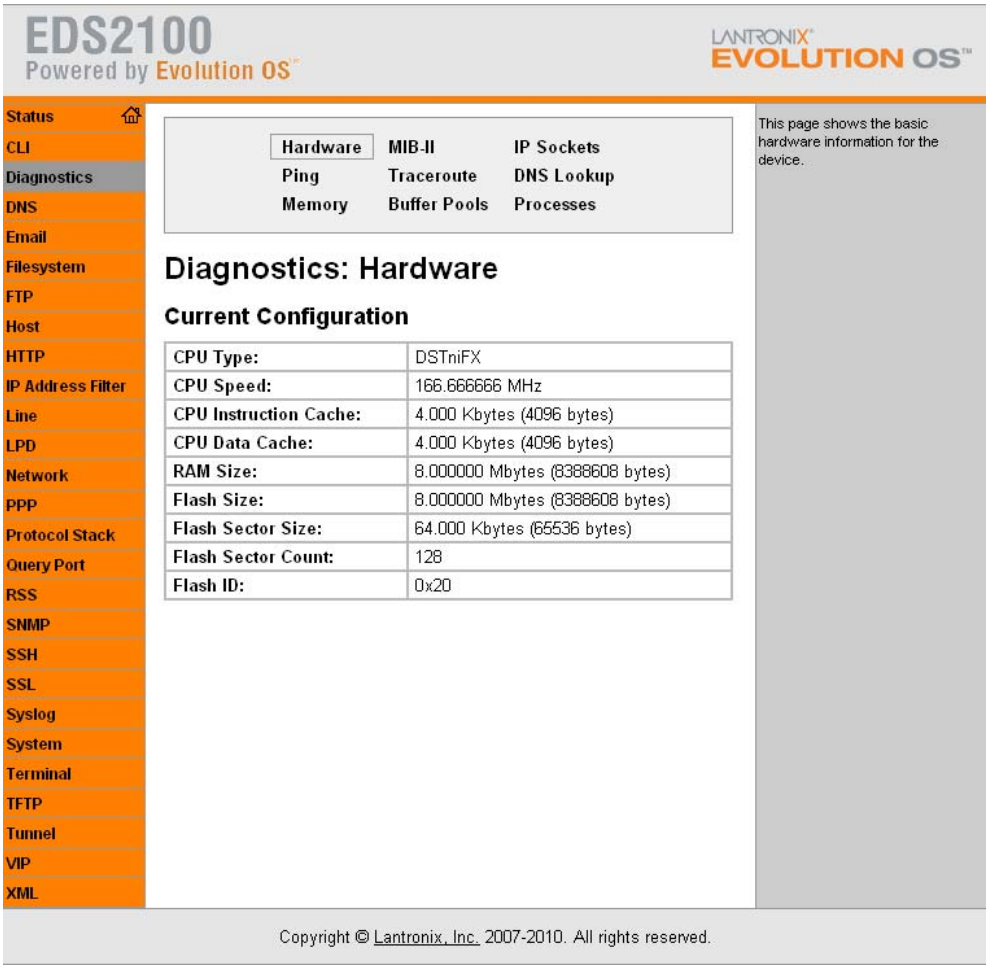
- Hardware
- MIB-II
- IP Sockets
- Ping
- Traceroute
- DNS Lookup
- Memory
- Buffer Pools
- Processes

## Hardware

To display the Hardware configuration, perform the following steps.

1. Click **Diagnostics > Hardware**. Figure 13-9 shows the page that displays.

*Figure 13-9 Hardware Web Page*

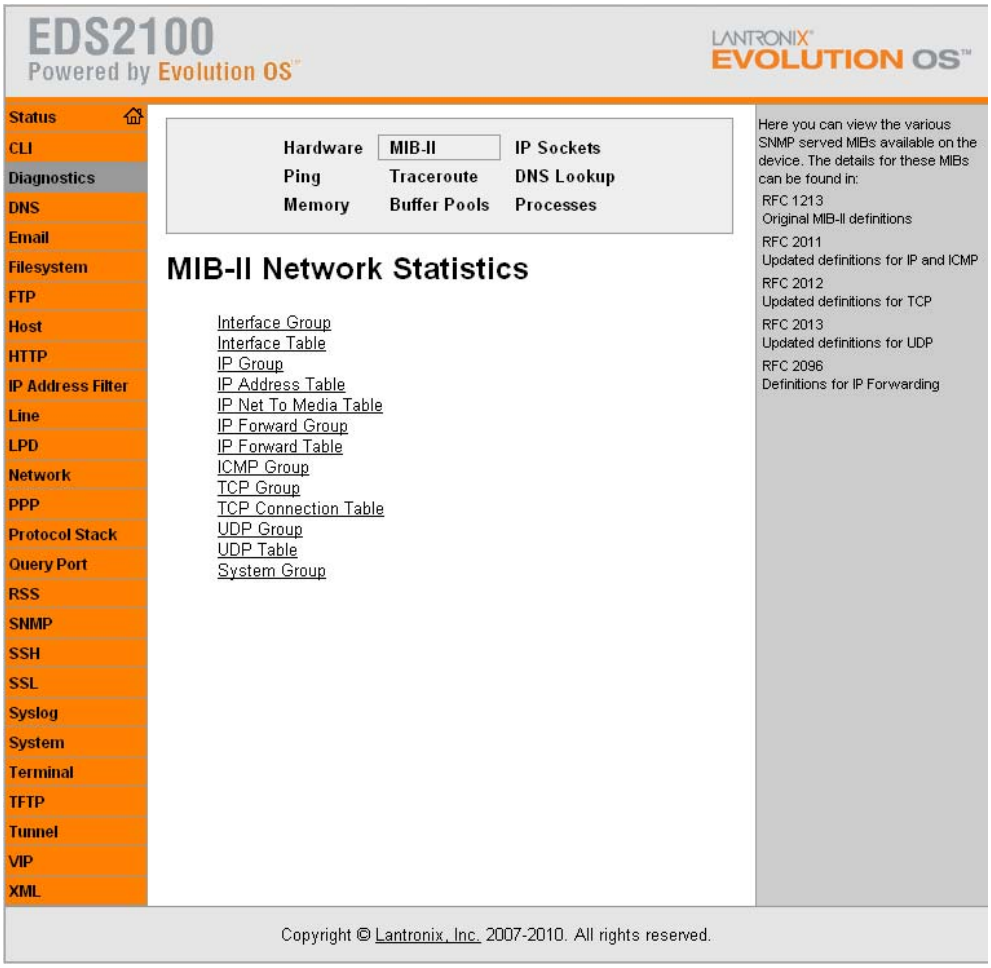



## MIB-II

The MIB-II Network Statistics page shows the available SNMP MIBs. To display MIB-II statistics, perform the following steps.

1. Click **Diagnostics > MIB-II** at the top of the page. Figure 13-10 shows the page that displays.

*Figure 13-10 MIB-II Web Page*




2. Click any of the links to open the corresponding table and statistics.

***Note:*** *For more information, refer to the following Requests for Comments (RFCs):*

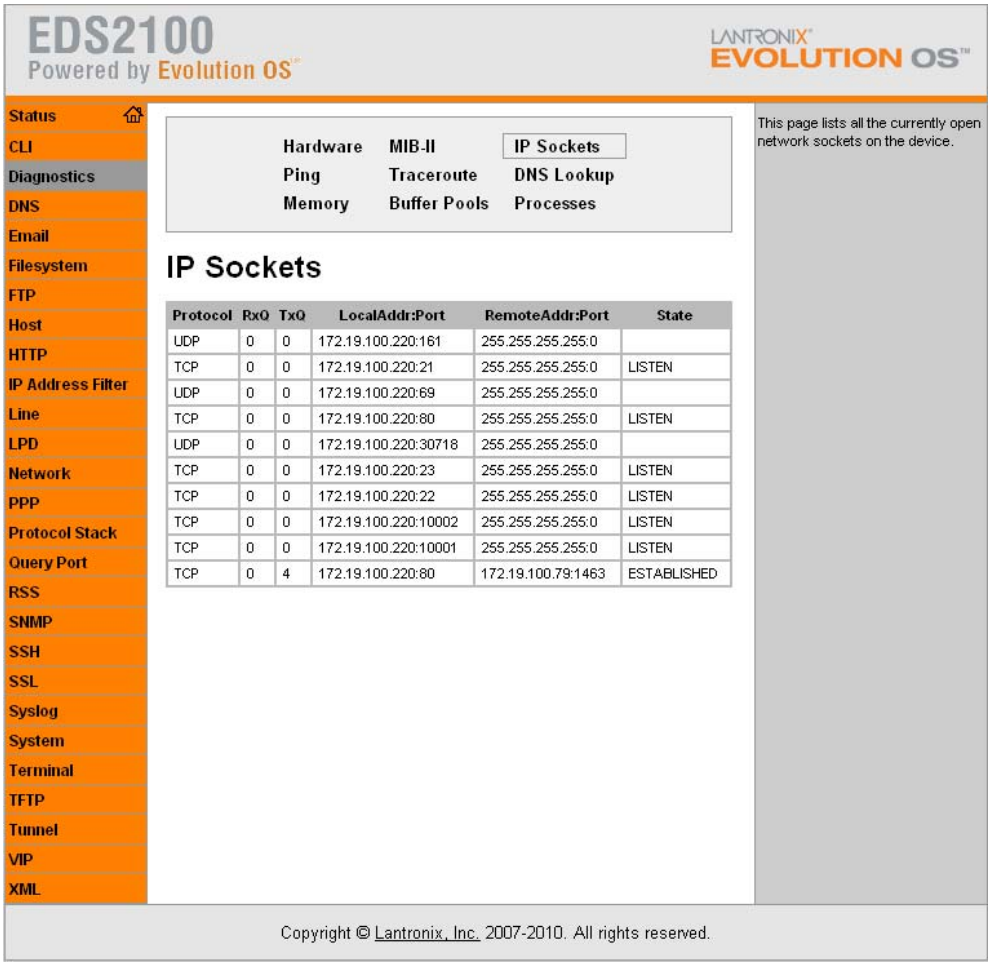
- RFC 1213—MIB-II definitions.
- RFC 2011—Updated definitions for IP and ICMP.
- RFC 2012—Updated definitions for TCP.
- RFC 2013—Updated definitions for UDP.
- RFC 2096—Definitions for IP forwarding.

## IP Sockets

To display all open IP sockets, perform the following steps.

1. Click **Diagnostics > IP Sockets**. Figure 13-11 shows the page that displays.

*Figure 13-11 IP Sockets Web Page*

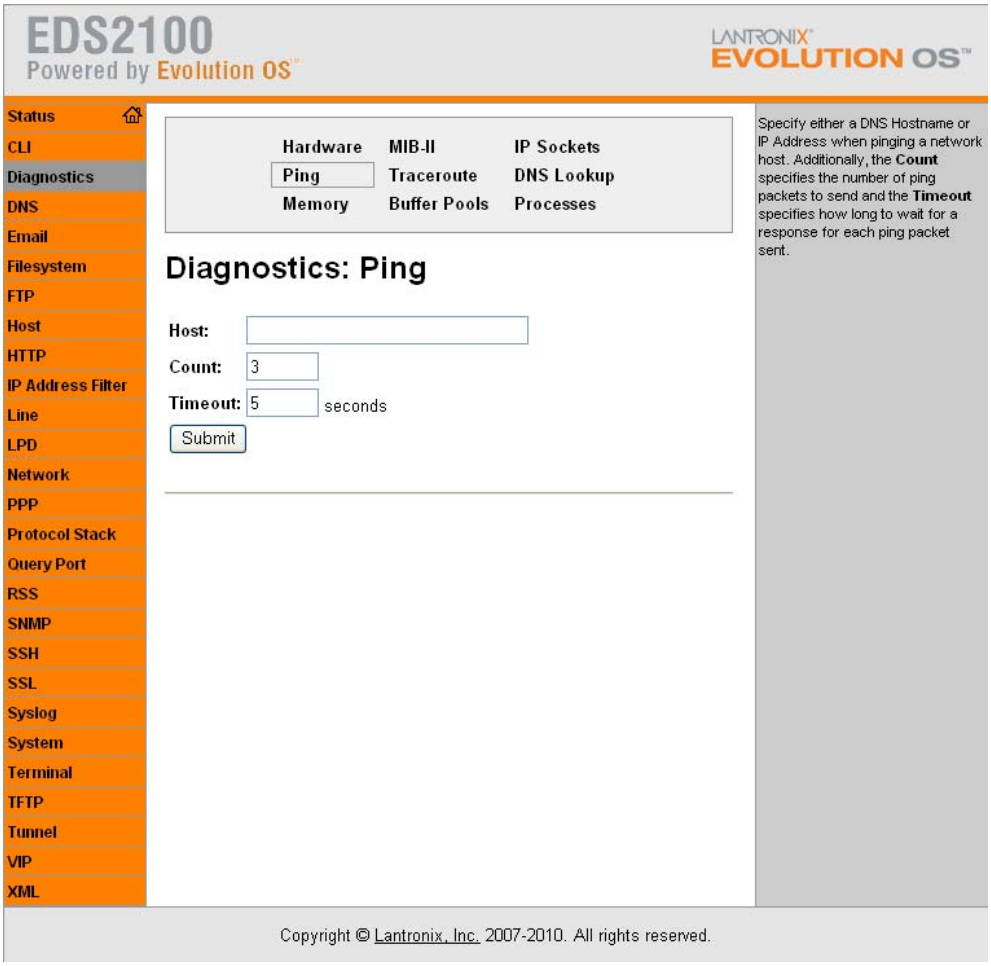



## Ping

To ping a remote device or computer, perform the following steps.

1. Click **Diagnostics > Ping**. Figure 13-12 shows the page that displays.

*Figure 13-12 Ping Web Page*




2. Enter or modify the fields in Table 13-5.

*Table 13-5 Ping Fields*

| Field | Description |
|---|---|
| **Host** | Enter the IP address or host name for the EDS1100/2100 to ping. |
| **Count** | Enter the number of ping packets EDS1100/2100 should attempt to send to the **Host**. The default is **3**. |
| **Timeout** | Enter the time, in seconds, for the EDS1100/2100 to wait for a response from the host before timing out. The default is **5** seconds. |

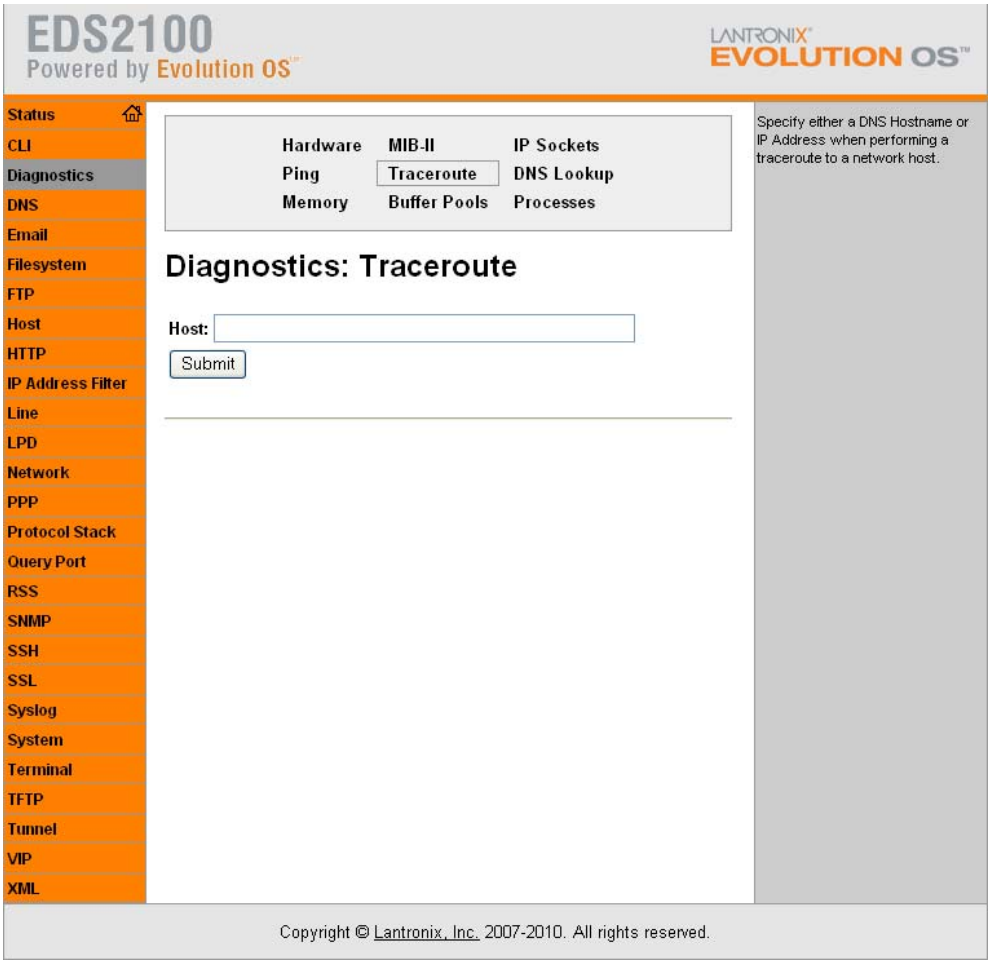
3. Click **Submit**.

## Traceroute

You can trace a packet route from the EDS1100/2100 to an Internet host, showing how many hops the packet requires to reach the host, and how long each hop takes. If you visit a web site whose pages appear slowly, you can use traceroute to determine where the longest delays are occurring. To use traceroute, perform the following steps.

1. Click **Diagnostics > Traceroute**. Figure 13-13 shows the page that displays.

*Figure 13-13 Traceroute Web Page*




2. Enter or modify the fields in Table 13-6.

*Table 13-6 Traceroute Fields*

| Field | Description |
|---|---|
| **Host** | Enter the IP address or DNS hostname. This address is used to show the path between it and the EDS1100/2100 when issuing the traceroute command. |
| **Count** | Enter the number of ping packets EDS1100/2100 should attempt to send to the Host. The default is **3** attempts. |
| **Timeout** | Enter the time, in seconds, for the EDS1100/2100 to wait for a response from the host before timing out. The default is **5** seconds. |

3. Click **Submit**.

## DNS Lookup

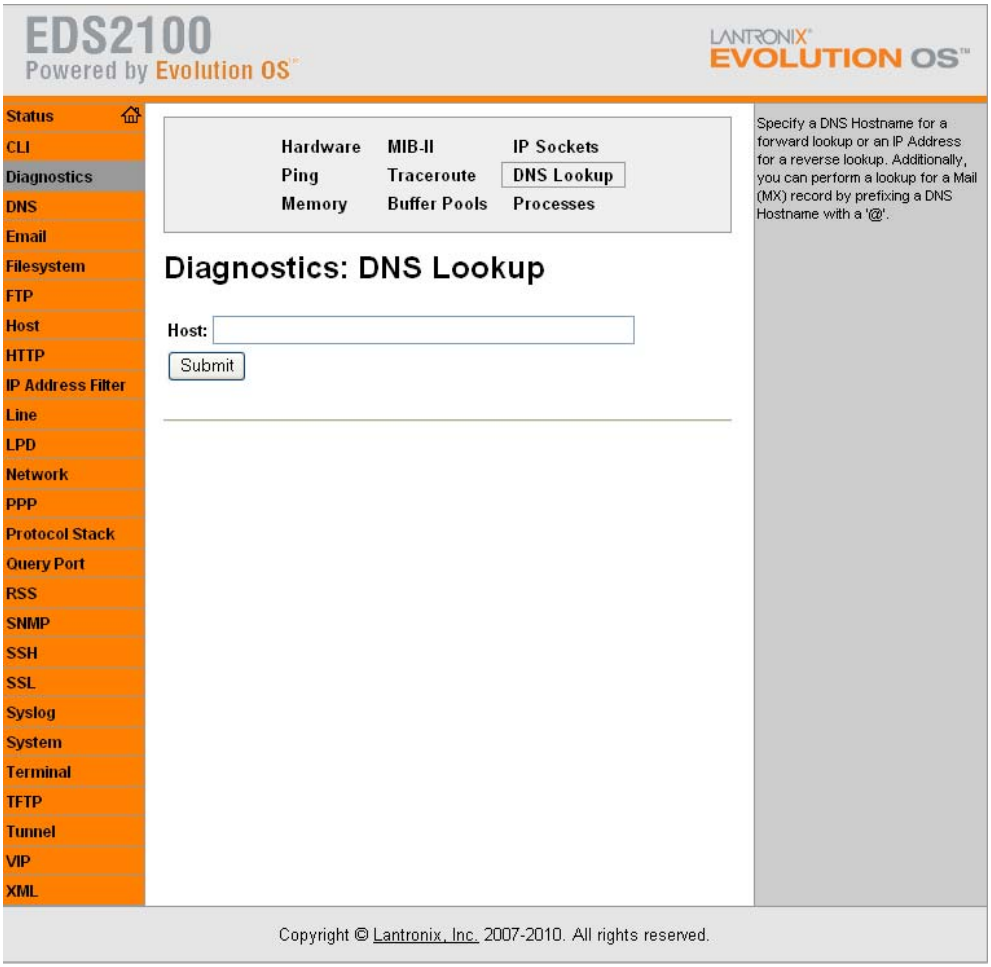
You can specify a DNS Hostname for a forward lookup or an IP address for a reverse lookup. You can also perform a lookup for a Mail (MX) record by prefixing a DNS Hostname with @.

***Note:*** *A DNS server must be configured for DNS Lookup to work.*

To use forward or reverse DNS lookup, perform the following steps.

1. Click **Diagnostics < DNS Lookup**. Figure 13-14 shows the page that displays.

***Figure 13-14 DNS Lookup Web Page***




2. Enter or modify the fields in Table 13-7.

***Table 13-7 DNS Lookup Fields***

| Field | Description |
|---|---|
| **Host** | Perform one of the following:<br>◆ For reverse lookup to locate the hostname for that IP address, enter an IP address.<br>◆ For forward lookup to locate the corresponding IP address, enter a hostname.<br>◆ To look up the Mail Exchange (MX) record IP address, enter a domain name prefixed with @. |

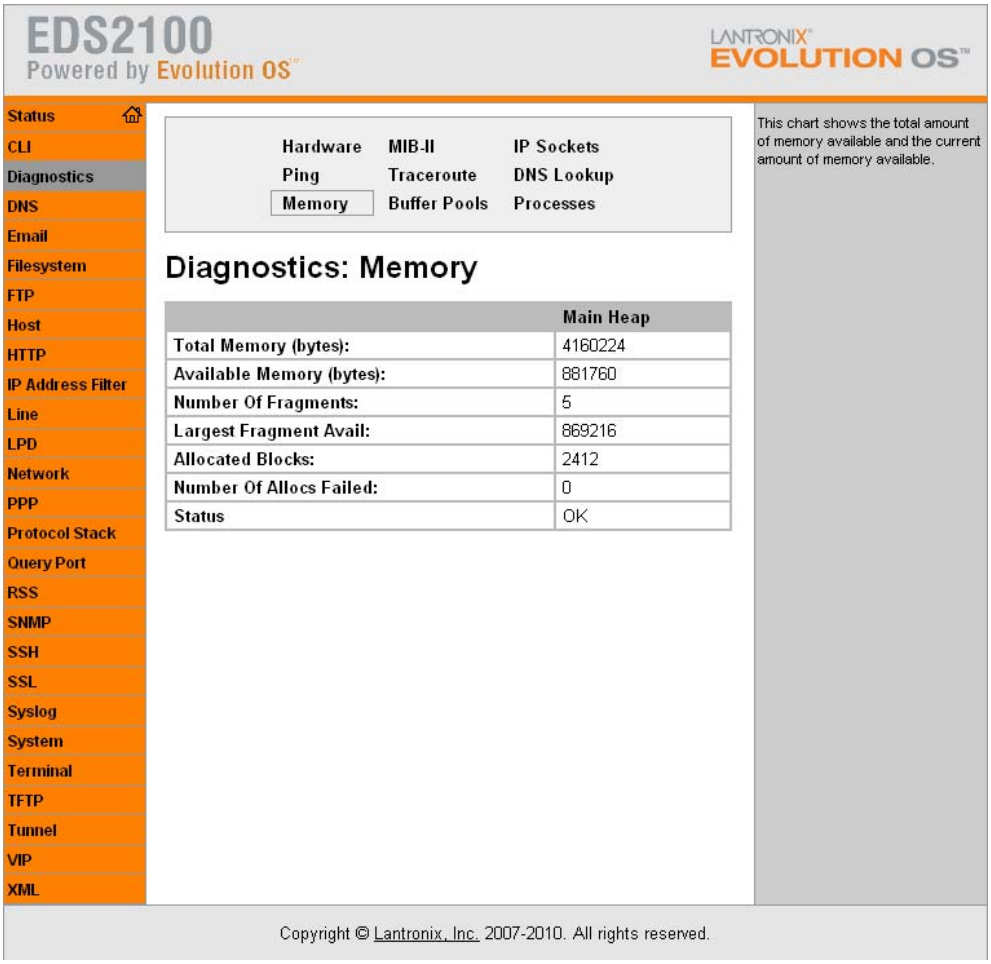
3. Click **Submit**.

## Memory

The Memory web page displays total and available memory in bytes, along with the number of fragments, allocated blocks, and memory status.To display memory statistics, perform the following steps.

1. Click **Diagnostics > Memory**. Figure 13-15 shows the page that displays.

***Figure 13-15 Memory Web Page***

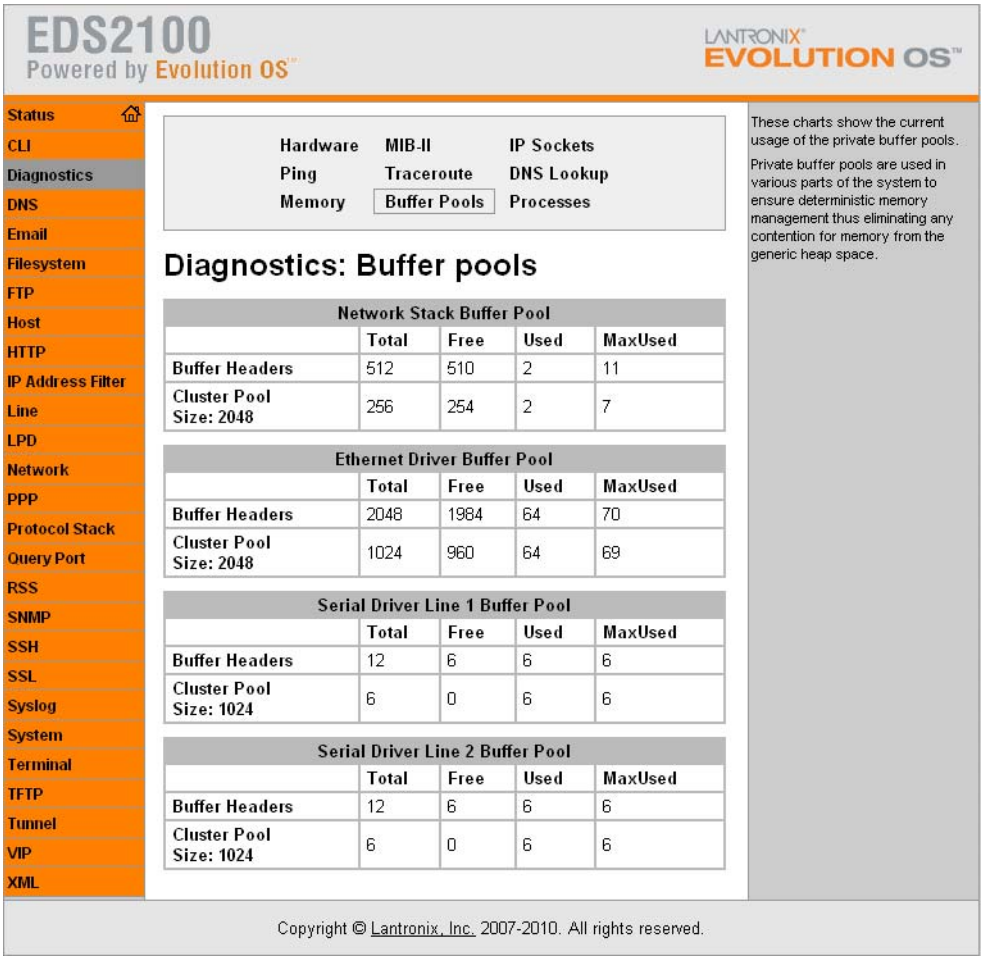



## Buffer Pools

Private buffer pools ensure deterministic memory management. To display the buffer pools, perform the following steps.

1. Click **Diagnostics > Buffer Pools**. Figure 13-16 shows the page that displays.

*Figure 13-16 Buffer Pools Web Page*

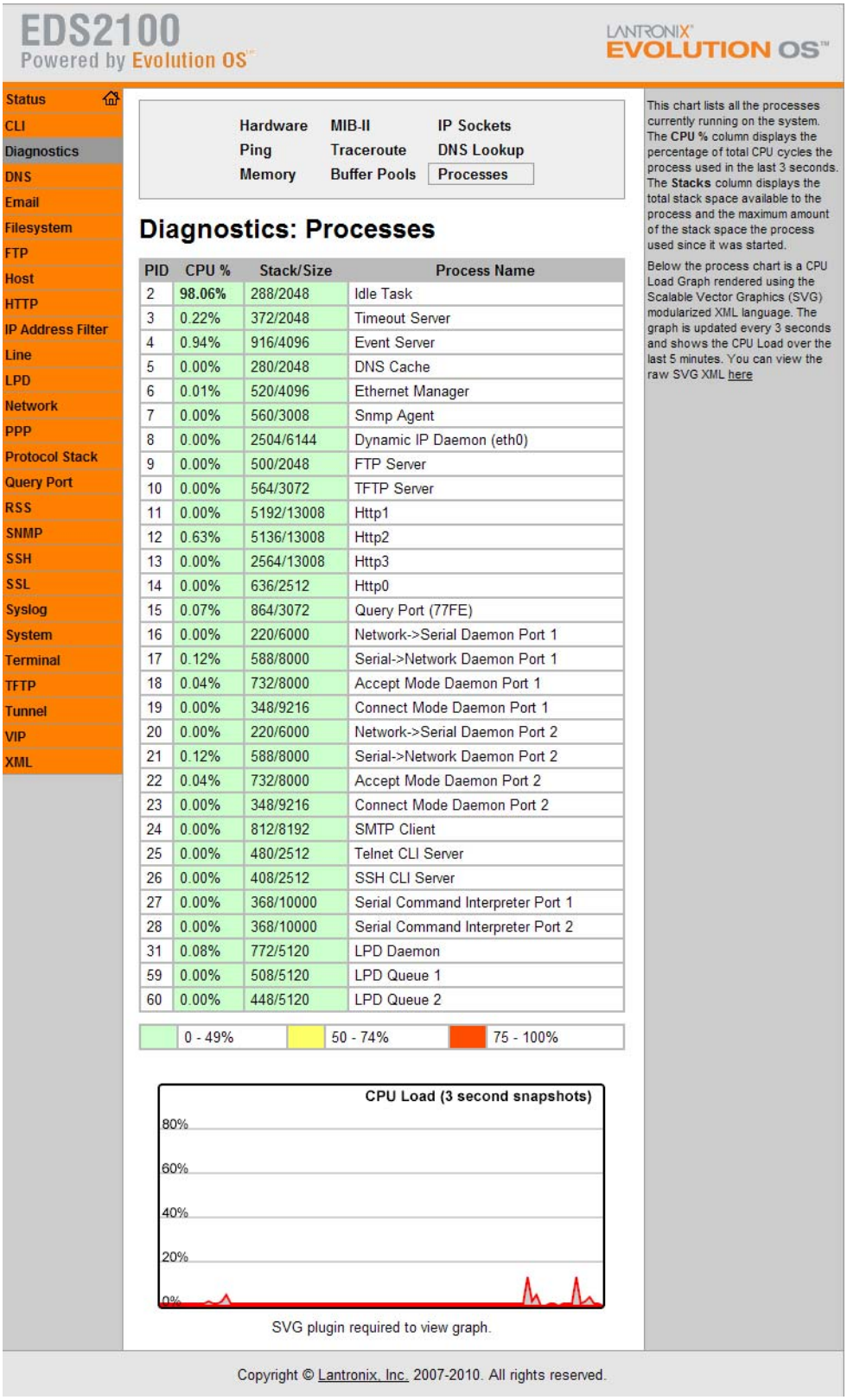



## Processes

The Processes web page shows all the processes currently running on the system. It shows the Process ID (PID), the percentage of total CPU cycles a process used within the last three seconds, the total stack space available, the maximum amount of stack space used by the process since it started, and the process name. To display the processes, perform the following steps.

1. Click **Diagnostics > Processes**. Figure 13-17 shows the page that displays.

***Figure 13-17 Processes Web Page***


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Hardware
MIB-II
IP Sockets
Ping
Traceroute
DNS Lookup
Memory
Buffer Pools
Processes
Diagnostics: Processes
PID
CPU %
Stack/Size
Process Name
2 98.06% 288/2048 Idle Task
3 0.22% 372/2048 Timeout Server
4 0.94% 916/4096 Event Server
5 0.00% 280/2048 DNS Cache
6 0.01% 520/4096 Ethernet Manager
7 0.00% 560/3008 Snmp Agent
8 0.00% 2504/6144 Dynamic IP Daemon (eth0)
9 0.00% 500/2048 FTP Server
10 0.00% 564/3072 TFTP Server
11 0.00% 5192/13008 Http1
12 0.63% 5136/13008 Http2
13 0.00% 2564/13008 Http3
14 0.00% 636/2512 Http0
15 0.07% 864/3072 Query Port (77FE)
16 0.00% 220/6000 Network->Serial Daemon Port 1
17 0.12% 588/8000 Serial->Network Daemon Port 1
18 0.04% 732/8000 Accept Mode Daemon Port 1
19 0.00% 348/9216 Connect Mode Daemon Port 1
20 0.00% 220/6000 Network->Serial Daemon Port 2
21 0.12% 588/8000 Serial->Network Daemon Port 2
22 0.04% 732/8000 Accept Mode Daemon Port 2
23 0.00% 348/9216 Connect Mode Daemon Port 2
24 0.00% 812/8192 SMTP Client
25 0.00% 480/2512 Telnet CLI Server
26 0.00% 408/2512 SSH CLI Server
27 0.00% 368/10000 Serial Command Interpreter Port 1
28 0.00% 368/10000 Serial Command Interpreter Port 2
31 0.08% 772/5120 LPD Daemon
59 0.00% 508/5120 LPD Queue 1
60 0.00% 448/5120 LPD Queue 2
0 - 49%
50 - 74%
75 - 100%
CPU Load (3 second snapshots)
80%
60%
40%
20%
0%
SVG plugin required to view graph.
This chart lists all the processes currently running on the system. The CPU % column displays the percentage of total CPU cycles the process used in the last 3 seconds. The Stacks column displays the total stack space available to the process and the maximum amount of the stack space the process used since it was started.
Below the process chart is a CPU Load Graph rendered using the Scalable Vector Graphics (SVG) modularized XML language. The graph is updated every 3 seconds and shows the CPU Load over the last 5 minutes. You can view the raw SVG XML here
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***Note:*** *The Adobe SVG plug-in is required to view the CPU Load Graph.*

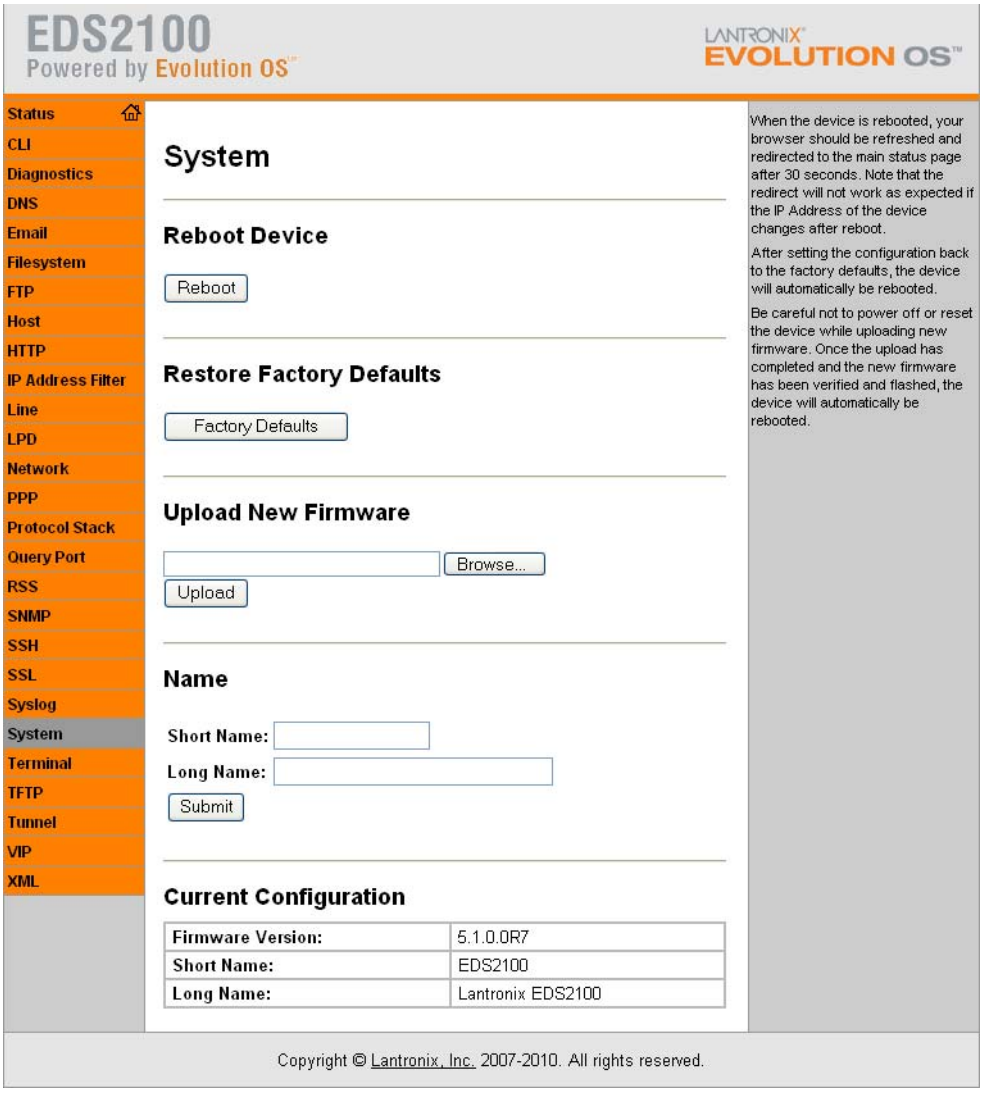
# System

The System web page enables the rebooting of the device, restoring factory defaults, uploading new firmware, specifying the short and long name, and viewing the current system configuration.

To configure system settings, perform the following steps.

1. Click **System** on the Main Menu. Figure 13-18 shows the page that displays.

***Figure 13-18 System Web Page***




2. Enter or modify the fields in Table 13-8.

***Table 13-8 System Fields***

| Field | Description |
|---|---|
| **Reboot Device** | Click **Reboot** to reboot the system. The system refreshes and redirects the browser to the home page. |

*Table 13-8 System Fields (continued)*

| Field | Description |
|---|---|
| **Restore Factory Defaults** | Click **Factory Defaults** to restore the EDS1100/2100 to the original factory settings. All configurations will be lost. The EDS1100/2100 automatically reboots upon setting back to the defaults. |
| **Upload New Firmware** | Click **Browse** to locate the firmware file location. Click **Upload** to install the firmware on the EDS1100/2100. The device automatically reboots upon the installation of new firmware. |
| **Name** | Enter a new **Short Name** and a **Long Name** (if necessary). The **Short Name** maximum is 32 characters. The **Long Name** maximum is 64 characters. Changes take place upon the next reboot. |

3. Click **Submit**.

# 14: Advanced Settings

This chapter describes advanced configuration of Email, CLI, and XML. It contains the following sections:


- Email Statistics
- Email Configuration
- Command Line Interface
- XML Configuration

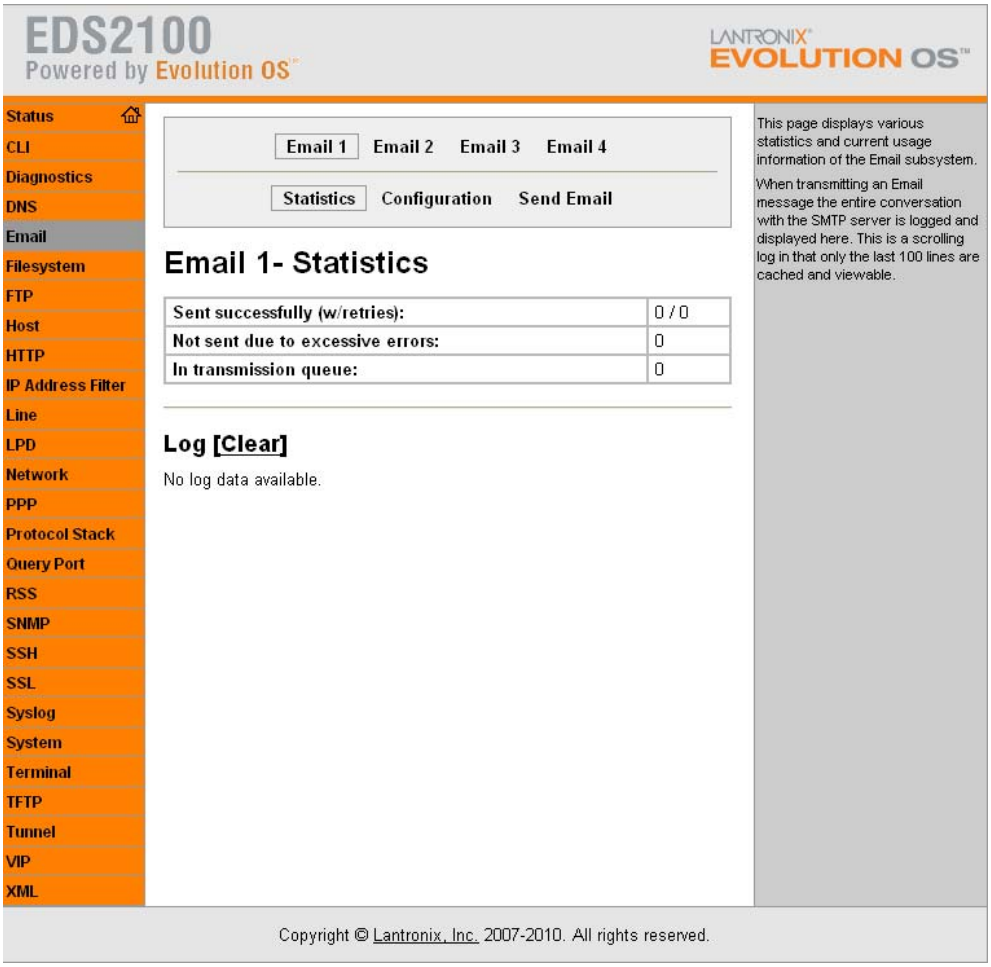

## Email Statistics

The Email Statistics web page displays when you click Email from the Main Menu. It shows statistics and current usage information about the email subsystem. When you transmit an email, the transimission to the SMTP server gets logged and displayed in the bottom portion of the page.

To view the statistics, perform the following steps.

1. Click **Email** on the Main Menu. Figure 14-1 shows the page that displays.

***Figure 14-1 Email Statistics Web Page***



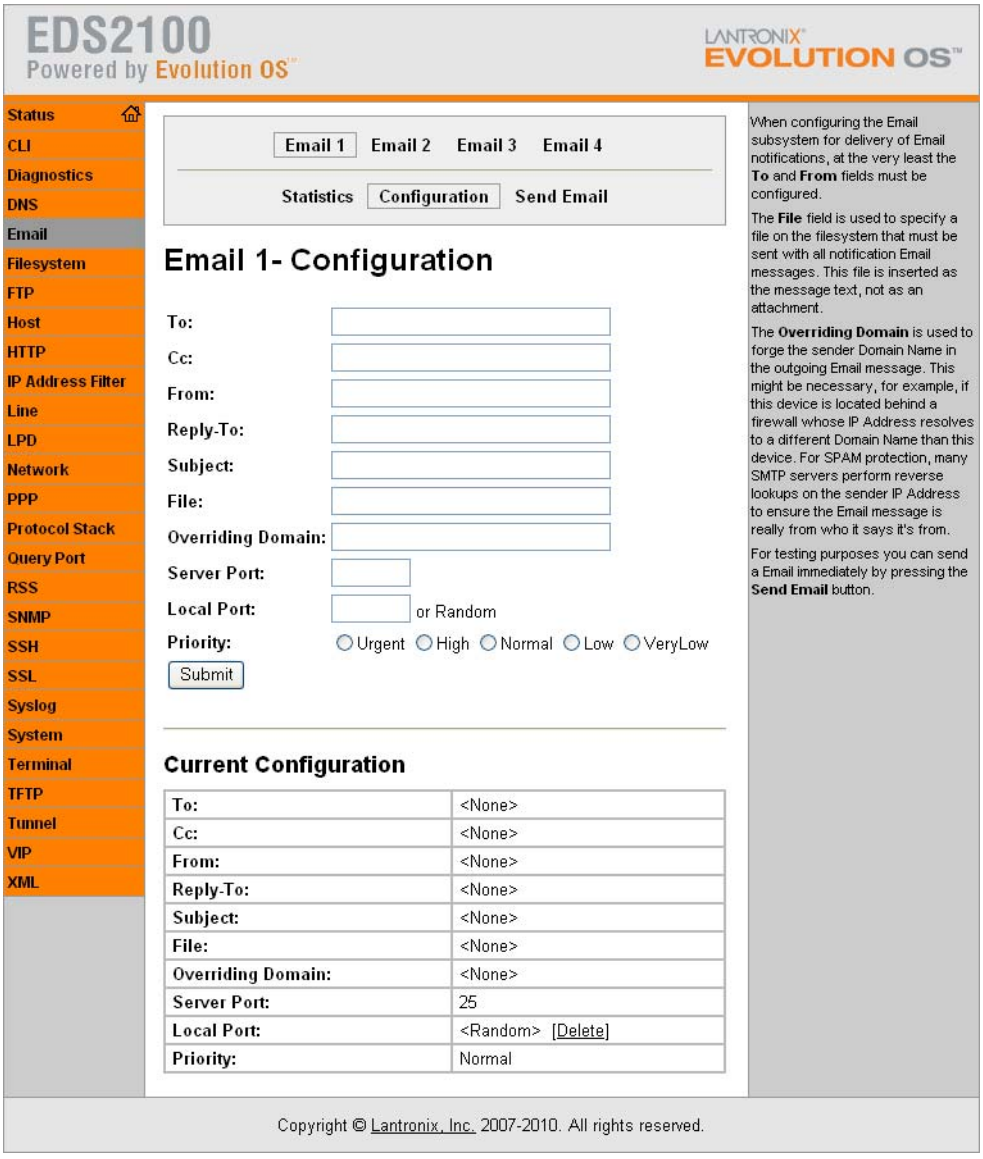
2. Click the **Log** [**Clear**] link to clear the log.

# Email Configuration

The EDS1100/2100 allows you to view and configure email alerts relating to the events occurring within the system. To configure email settings, perform the following steps.

1. Click **Email > Email 1 > Configuration**. Figure 14-2 shows the page that displays.

***Figure 14-2 Email 1 Configuration Web Page***



2. Enter or modify the fields in Table 14-1.

***Table 14-1 Email 1 Configuration Fields***

| Field | Description |
|---|---|
| **To** | Enter the email address to which the email alerts will be sent. Multiple addresses are separated by semicolon (;). |
| **Cc** | Enter the email address to which the email alerts will be copied. Multiple addresses are separated by semicolon (;). |
| **From** | Enter the email address to list in the From field of the email alert. |
| **Reply-To** | Enter the email address to list in the Reply-To field of the email alert. |
| **Subject** | Enter the subject for the email alert. |
| **File** | Enter the path of the file to send with the email alert. This file appears within the message body of the email. |
| **Overriding Domain** | Enter the domain name to override the current domain name in EHLO (Extended Hello). |
| **Server Port** | Enter the SMTP server port number. The default is port **25**. |
| **Local Port** | Enter the local port to use for email alerts. The default is a random port number. |
| **Priority** | Select the priority level for the email alert. |
| **Trigger Email Send** | Configure this field to send an email based on a CP Group trigger. The EDS1100/2100 sends an email when the specified **Value** matches the current **Group**'s value. |

3. Click **Submit**.
4. Test your configuration by sending an email by clicking **Send Email**. Return to the **Statistics** web page for a log of the transmission.

***Note:*** *You can delete stored settings in the **Current Configuration** table by clicking on the [**Delete**] link.*

# Command Line Interface

The Command Line Interface (CLI) web page enables you to view statistics about the CLI servers listening on the Telnet and SSH ports and to configure CLI settings. When a connection is active, the following display:

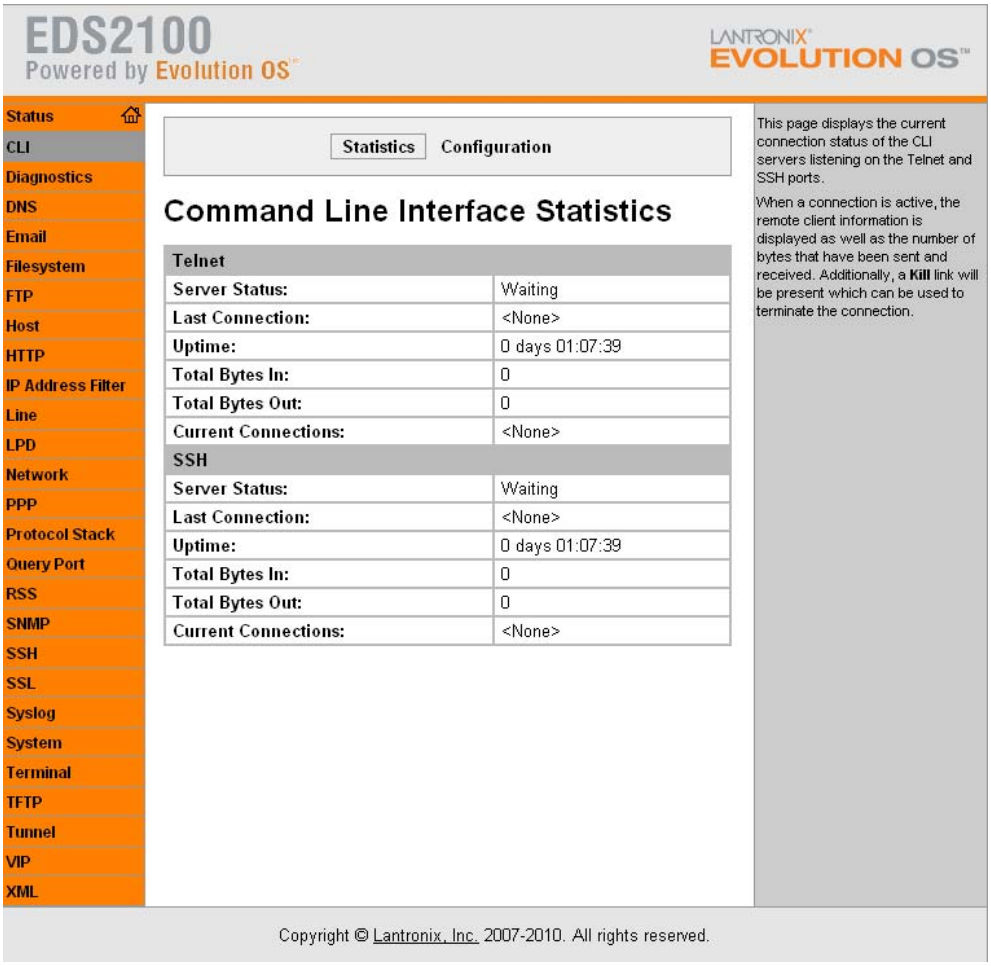
- Remote client information
- Number of bytes that have been sent and received
- Kill link to terminate the connection

## CLI Statistics

To view the CLI Statistics, perform the following steps.

1. Click **CLI** on the Main Menu. Figure 14-3 shows the page that displays.

*Figure 14-3 CLI Statistics Web Page*

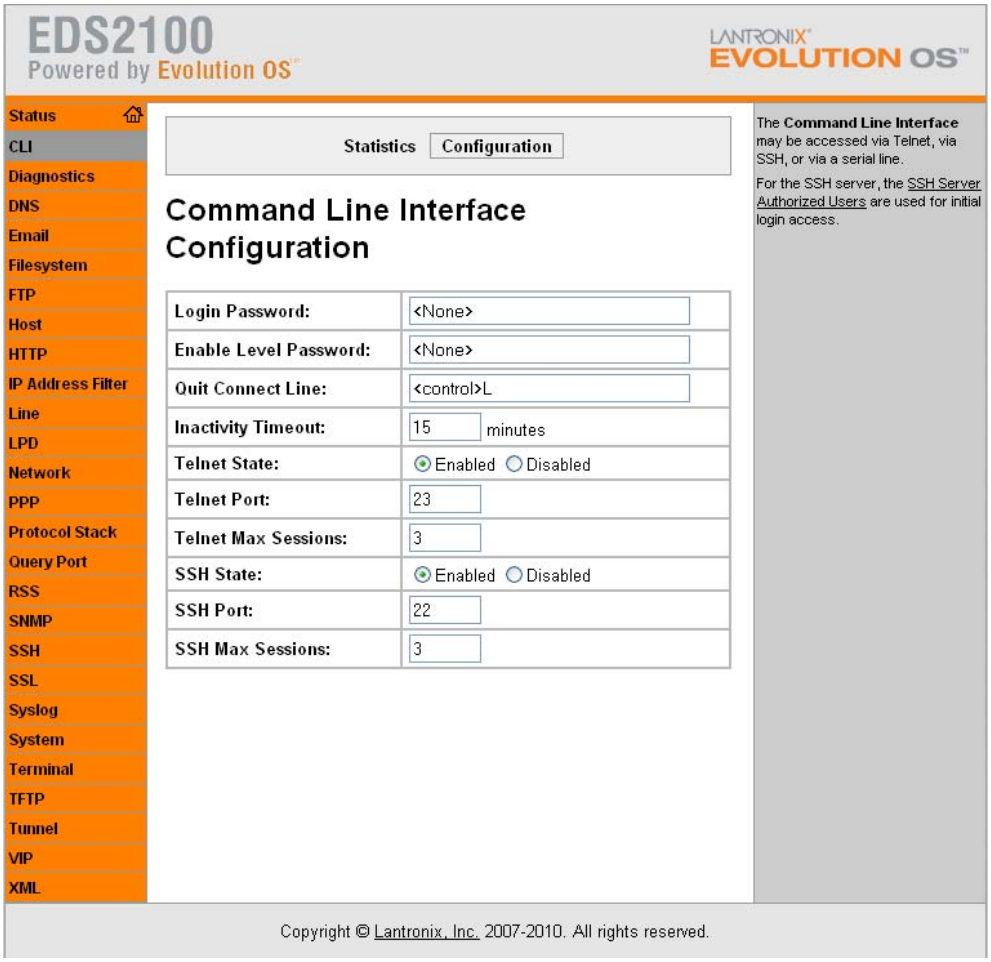



## CLI Configuration

To configure the CLI, perform the following steps.

1. Click **CLI > Configuration**. Figure 14-4 shows the page that displays.

*Figure 14-4 CLI Configuration Web Page*




2. Enter or modify the fields in Table 14-2.

*Table 14-2 CLI Configuration Fields*

| Field | Description |
|---|---|
| **Login Password** | Enter the password for Telnet access. |
| **Enable Level Password** | Enter the password for access to the Command Mode Enable level. There is no password by default. |
| **Quit connect line** | Enter a string to terminate a connect line session and resume the CLI. Type **<control>** before any key the user must press when holding down the **Ctrl** key. An example of such a string is **<control>L.** |
| **Inactivity Timeout** | Set an Inactivity Timeout value so the CLI session will disconnect if no data is received after the designated time period. Default is 15 minutes. Enter a value of 0 to disable. |
| **Telnet State** | Select **On** to enable Telnet access. Telnet is enabled by default. |
| **Telnet Port** | Enter the Telnet port to use for Telnet access. The default is **23**. |
| **Telnet Max Sessions** | Maximum number of simultaneous Telnet sessions. |

*Table 14-2 CLI Configuration Fields (continued)*

| Field | Description |
|---|---|
| **SSH State** | Select **On** to enable SSH access. SSH is enabled by default. |
| **SSH Port** | Enter the SSH port to use for SSH access. The default is **22**. |
| **SSH Max Sessions** | Maximum number of simultaneous SSH sessions. |

3. Click **Submit**.

# XML Configuration

The EDS1100/2100 enables configuration of devices by using XML configuration records (XCRs). You can export an existing configuration for use on other EDS1100/2100s or import a saved configuration file.

On the XML: Export Configuration web page, you can export the current system configuration in XML format. The generated XML file can be imported later to restore a configuration. It can also be modified and imported to update the configuration on this EDS1100/2100 unit or another. The XML data can be exported to the browser window or to a file on the file system.

By default, all groups are selected except those pertaining to the network configuration (Ethernet and WLAN). This is so that if you later import the entire XML configuration, it will not break your network connectivity. You may select or clear the checkbox for any group.

In the XML: Import System Configuration Page you can import a system configuration from an XML file. The XML data can be imported from a file on the file system or uploaded using HTTP. The groups to import can be specified by toggling the respective group item or entering a filter string. When toggling a group item, all instances of that group will be imported. The filter string can be used to import specific instances of a group. The text format of this string is:

```
<g>:<i>;<g>:<i>;...
```

For example, if you only wanted to import the line 1 setting from an XCR, use a filter string of line:1.

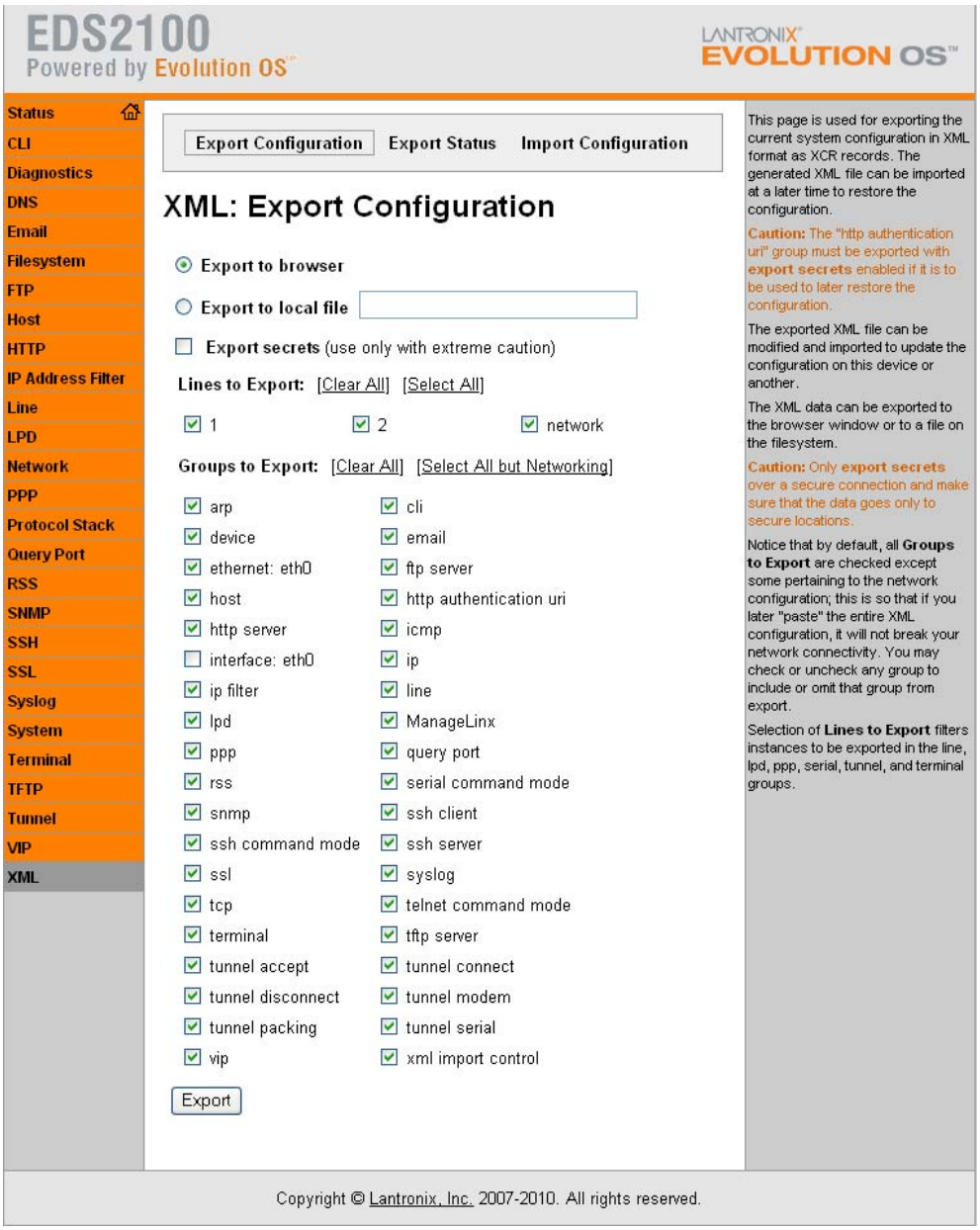
Each group name <g> is followed by a colon and the instance value <i>. Each <g> :<i> value is separated with a semicolon. If a group has no instance, specify the group name <g> only.

## XML Export Configuration

To export a system configuration record, perform the following steps.

1. Click **XML** on the Main Menu. Figure 14-5 shows the page that displays.

***Figure 14-5 XML Export Configuration Web Page***




2. Enter or modify the fields in Table 14-3:

***Table 14-3 XML Export Configuration Fields***

| Field | Description |
|---|---|
| **Export to browser** | Select this option to export the XCR data in the selected fields to a web browser. |

*Table 14-3 XML Export Configuration Fields (continued)*

| Field | Description |
|---|---|
| **Export to local file** | Select this option to export the XCR data to a file on the device. If you select this option, enter a file name for the XML configuration record. |
| **Export secrets** | Only use this with extreme caution. If selected, secret password and key information will be exported. Use only with a secure link, and save only in secure locations. |
| **Lines to Export** | Select the instances you want to export in the line, LPD, PPP, tunnel, and terminal groups. |
| **Groups to Export** | Check the configuration groups that are to be exported to the XML configuration record. |

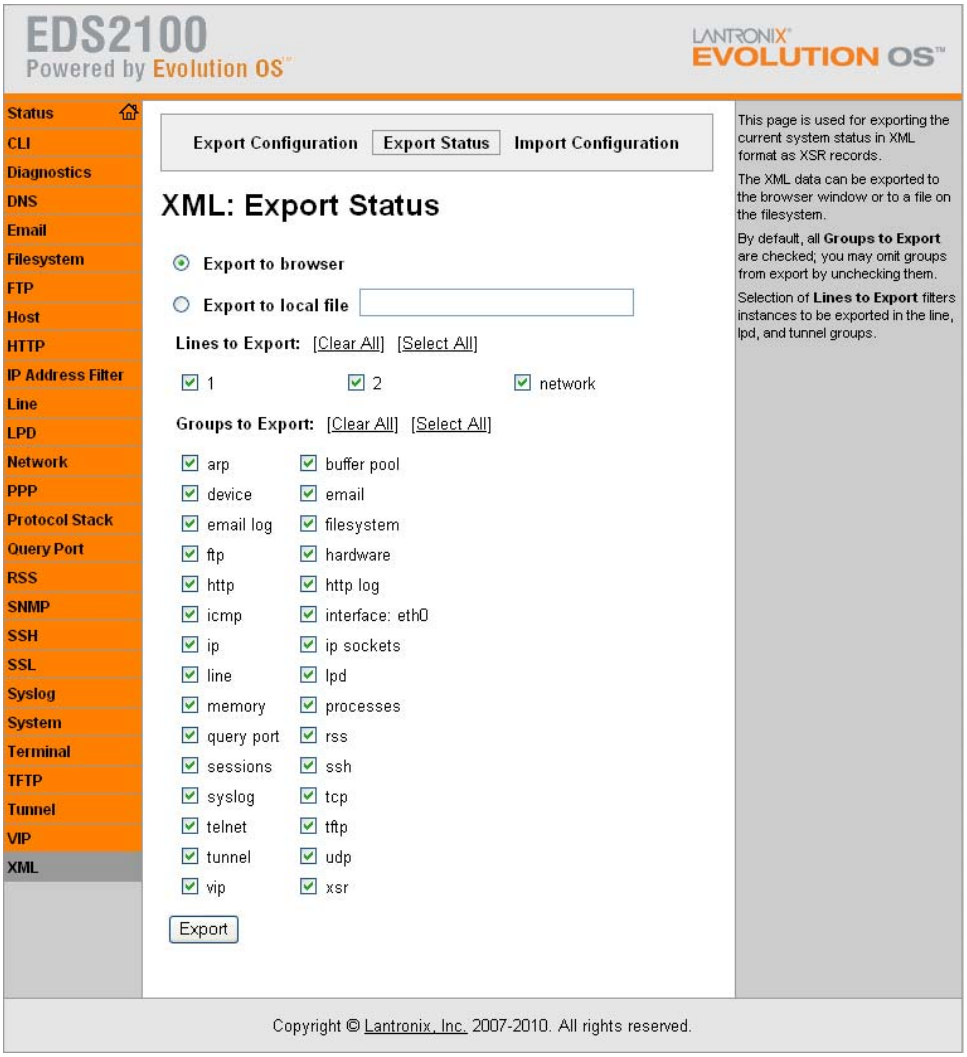
3. Click **Export**. The groups display if exporting to the browser. If exporting to the file system, the EDS1100/2100 requests a filename for the XML configuration record.

## Export Status

To export system status in XML format, perform the following steps.

1. Click **XML > Export Status**. Figure 14-6 shows the page that displays.

*Figure 14-6 XML Export Status Web Page*




2. Enter or modify the fields in Table 14-4.

*Table 14-4 XML Export Status Fields*

| Field | Description |
|---|---|
| **Export to browser** | Select this option to export the XML status record to a web browser. |
| **Export to local file** | Select this option to export the XML status record to a file on the device. If you select this option, enter a file name for the XML status record. |
| **Lines to Export** | Select the instances you want to export in the line, LPD, PPP, tunnel, and terminal groups. |
| **Groups to Export** | Check the configuration groups that are to be exported into the XML status record. |

3. Click **Export**. The groups display if exporting to the browser. If exporting to the file system, the EDS1100/2100 requests a filename.

## Import Configuration

To import a system configuration, perform the following steps.

1. Click **XML > Import Configuration**. Figure 14-7 shows the page that displays.

***Figure 14-7 Import Configuration Web Page***

EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Export Configuration
Export Status
Import Configuration
XML: Import Configuration
Import:
Configuration from External file
Configuration from Filesystem
Line(s) from single line Settings on the Filesystem
This page is used for importing system configuration from an XML file.
Import Configuration from External file picks up all the settings from the external file.
Import Configuration from Filesystem picks up settings from the selected Groups, Lines and Instances.
Import Line(s) from single line Settings on the Filesystem copies lines settings from an the input file containing only one Line instance to all of the selected Lines.
When selecting a Whole Groups to Import item, all instances of that group will be imported. Notice that by default, all groups are checked except some pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.
Selection of Lines to Import filters instances to be imported in the line, lpd, ppp, serial, tunnel, and terminal groups. This affects both Whole Groups to Import and Text List selections.
Use the Text List string to import specific instances of a group. The textual format of this string is:
<g>:<i>;<g>:<i>;...
Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.
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2. Click **Configuration from External file**. Figure 14-8 shows the page that displays.

*Figure 14-8 Import Configuration from External File Web Page*

EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Export Configuration
Export Status
Import Configuration
XML: Import Configuration
Import configuration from (entire) external XCR file:
Browse...
Import
This page is used for importing system configuration from an XML file.
Import Configuration from External file picks up all the settings from the external file.
Import Configuration from Filesystem picks up settings from the selected Groups, Lines and Instances. Import Line(s) from single line Settings on the Filesystem copies lines settings from an the input file containing only one Line instance to all of the selected Lines.
When selecting a Whole Groups to Import item, all instances of that group will be imported. Notice that by default, all groups are checked except some pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.
Selection of Lines to Import filters instances to be imported in the line, lpd, ppp, serial, tunnel, and terminal groups. This affects both Whole Groups to Import and Text List selections.
Use the Text List string to import specific instances of a group. The textual format of this string is:
<g>:<i>;<g>:<i>;...
Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.
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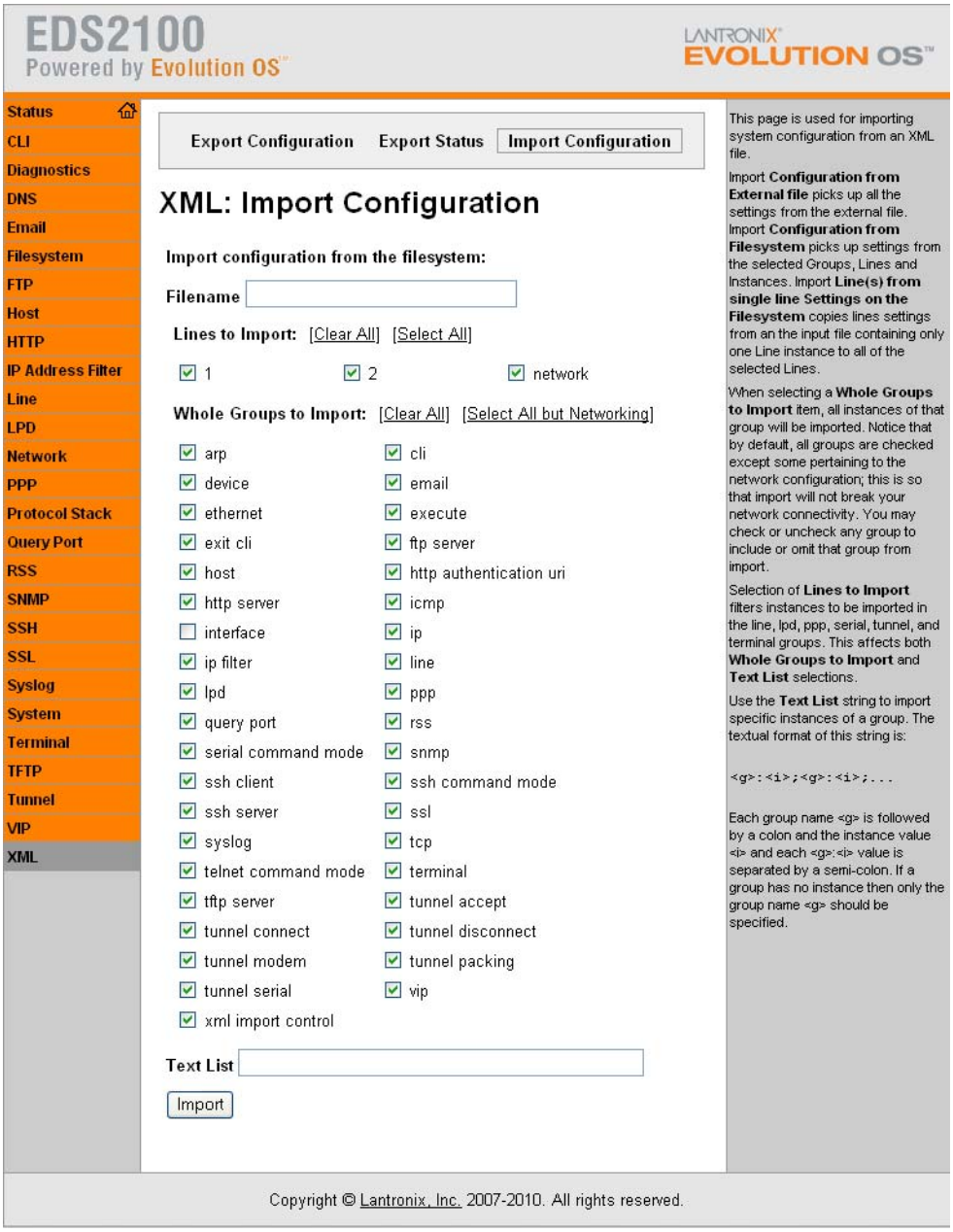
3. Enter the path and file name of the external XCR file you want to import or browse to select the XCR file.
4. Go back to the Import Configuration web page.
5. Click **Configuration from Filesystem**. Figure 14-9 shows the page that displays.

*Figure 14-9 Import Configuration from Filesystem Web Page*




6. Enter the fields shown in Table 14-5.

*Table 14-5 Import Configuration from Filesystem Fields*

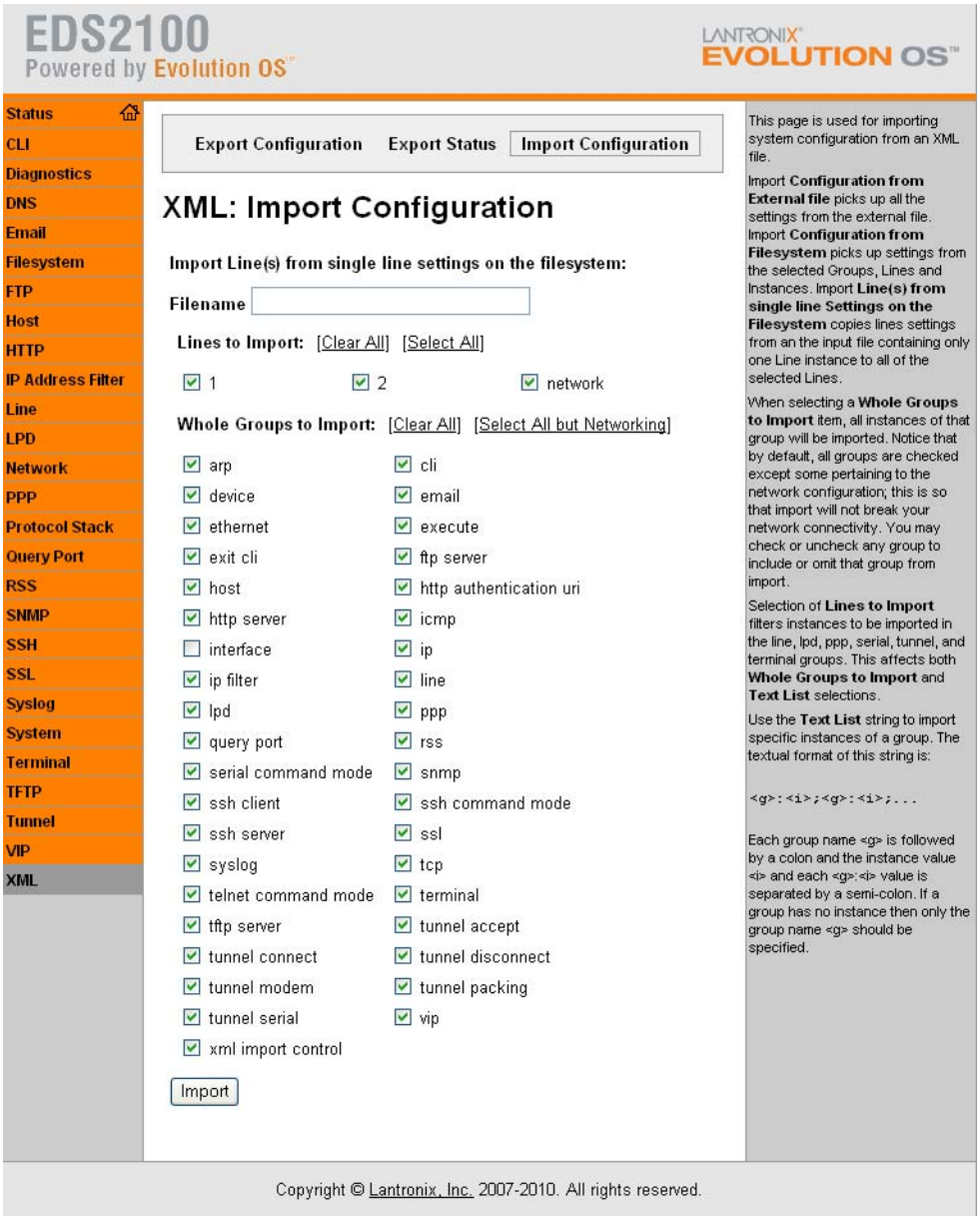
| Field | Description |
|---|---|
| **Filename** | Enter the name of the file on the EDS1100/2100 (local to its filesystem) that contains XCR data. |

*Table 14-5 Import Configuration from Filesystem Fields (continued)*

| Field | Description |
|---|---|
| **Lines to Import** | Select the lines or network whose settings you want to import. Click the **Select All** link to select all the serial lines and the network lines. Click the **Clear All** link to clear all of the checkboxes. By default, all line instances are selected.<br>Only the selected line instances will be imported in the line, LPD, PPP, tunnel, and terminal groups. |
| **Whole Groups to Import** | Select the configuration groups to import from the XML configuration record. This option imports all instances of each selected group unless it is one of the **Lines to Import**.<br>***Note:*** *By default, all groups are checked except those pertaining to the network configuration; this is so that import will not break your network connectivity.*<br>You may check or uncheck any group to include or omit that group from import. To import all of the groups, click the **Select All but Networking** link to import all groups. To clear all the checkboxes, click the **Clear All** link. |
| **Text List** | Enter a string to import specific instances of a group. The textual format of this string is: <g>:<i>;<g>:<i>;.<br>Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance, then specify the group name <g> only.<br>Use this option for groups other than those affected by **Lines to Import**. |

7. Go back to the **Import Configuration** web page.
8. Click **Line(s) from single line Settings on the Filesystem**. Figure 14-10 shows the page that displays.

*Figure 14-10 Import Lines from Single Line Settings on the Filesystem Web Page*


EDS2100
Powered by Evolution OS
LANTRONIX
EVOLUTION OS
Status
CLI
Diagnostics
DNS
Email
Filesystem
FTP
Host
HTTP
IP Address Filter
Line
LPD
Network
PPP
Protocol Stack
Query Port
RSS
SNMP
SSH
SSL
Syslog
System
Terminal
TFTP
Tunnel
VIP
XML
Export Configuration
Export Status
Import Configuration
XML: Import Configuration
Import Line(s) from single line settings on the filesystem:
Filename
Lines to Import: [Clear All] [Select All]
1
2
network
Whole Groups to Import: [Clear All] [Select All but Networking]
arp
cli
device
email
ethernet
execute
exit cli
ftp server
host
http authentication uri
http server
icmp
interface
ip
ip filter
line
lpd
ppp
query port
rss
serial command mode
snmp
ssh client
ssh command mode
ssh server
ssl
syslog
tcp
telnet command mode
terminal
tftp server
tunnel accept
tunnel connect
tunnel disconnect
tunnel modem
tunnel packing
tunnel serial
vip
xml import control
Import
This page is used for importing system configuration from an XML file.
Import Configuration from External file picks up all the settings from the external file. Import Configuration from Filesystem picks up settings from the selected Groups, Lines and Instances. Import Line(s) from single line Settings on the Filesystem copies lines settings from an the input file containing only one Line instance to all of the selected Lines.
When selecting a Whole Groups to Import item, all instances of that group will be imported. Notice that by default, all groups are checked except some pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.
Selection of Lines to Import filters instances to be imported in the line, lpd, ppp, serial, tunnel, and terminal groups. This affects both Whole Groups to Import and Text List selections.
Use the Text List string to import specific instances of a group. The textual format of this string is:
<g>:<i>;<g>:<i>;...
Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.
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***Note:*** *You can copy line settings from the single line instance in the input file to selected lines by using this page. The import file may only contain records from a single line instance; this is done by selecting a single* ***Line to Export*** *when exporting the file.*

9. Enter or modify the fields in Table 14-6.

*Table 14-6 Import Lines from Single Line Settings Fields*

| Field | Description |
|---|---|
| **Filename** | Provide the name of the file on the EDS1100/2100 (local to its file system) that contains XCR data. |

*Table 14-6 Import Lines from Single Line Settings Fields (continued)*

| Field | Description |
|---|---|
| **Lines to Import** | Select the line(s) whose settings you want to import. Click the **Select All** link to select all the serial lines and the network lines. Click the **Clear All** link clear all of the checkboxes. By default, all serial line instances are selected. |
| **Whole Groups to Import** | Select the configuration groups to import from the XML configuration record.<br>***Note:*** *By default, all groups are checked except #those pertaining to the network configuration; this is so that import will not break your network connectivity.*<br>You may check or uncheck any group to include or omit that group from import. To import all of the groups, click the **Select All but Networking** link to import all groups. To clear all the checkboxes, click the **Clear All** link. |

# 15: Branding the EDS1100/2100

This chapter describes how to brand your EDS1100 or EDS2100 by using Web Manager and Command Line Interface (CLI). It contains the following sections:


- Web Manager Customization
- Short and Long Name Customization


## Web Manager Customization

Customize the Web Manager appearance by modifying index.html and style.css. The style (fonts, colors, and spacing) of the Web Manager get controlled with style.css and the text and graphics are controlled with index.html.

The Web Manager files are hidden and are incorporated directly into the firmware image but may be overridden by placing the appropriate file in the appropriate directory on the file system.

To retrieve and overwrite Web Manager files, perform the following steps.

1. FTP to the EDS1100 or EDS2100.
2. Make a directory (**mkdir**) and name it http/config.
3. Change to the directory (**cd**) that you created in Step 2 (http/config).
4. Get the file by using **get** <*filename*>.
5. Modify the file as required or create a new one with the same name.
6. Put the file by using **put** <filename>.
7. Type **quit**.

The overriding files display in the http/config directory. Restart any open browser to view the changes. If you want to return to the default files in the firmware image, delete the overriding files from the file system.

## Short and Long Name Customization

You can customize the short and long names in Web Manager. The names display in the CLI show command and in the **System** web page in the Current Configuration table.. The short name is used for the show command. Both names display in the CLI Product Type field in the following example:

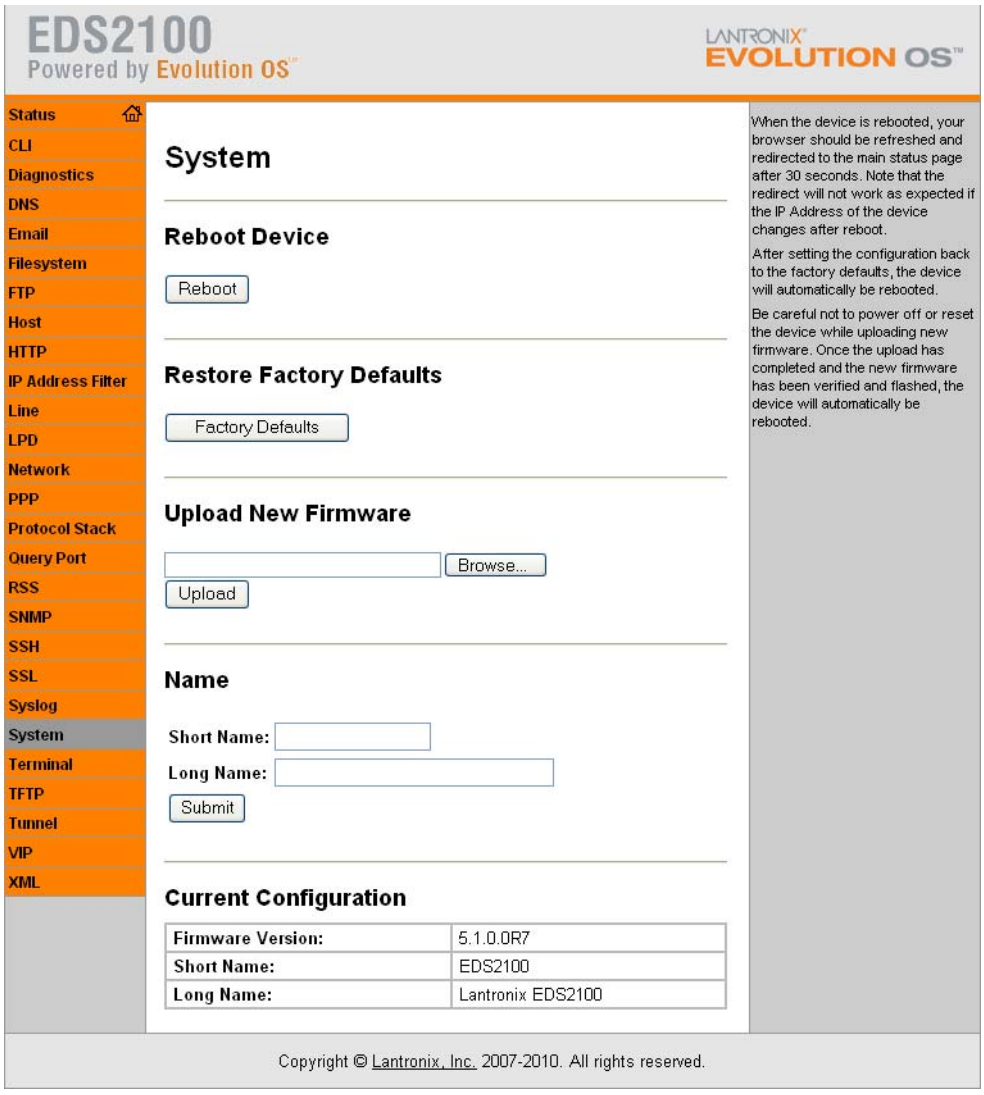
```
enable)# show
Product Information: EDS1100-YourCompanyName
Product Type: Lantronix EDS1100
```

In the Web Manager, the short and long names are shown in the **System** web page in the Current Configuration table.

To change the short and long names by using the Web Manager, perform the following steps.

1. Click **System** in the menu bar. Figure 15-1 shows the page that displays.

*Figure 15-1 EDS System Web Page*



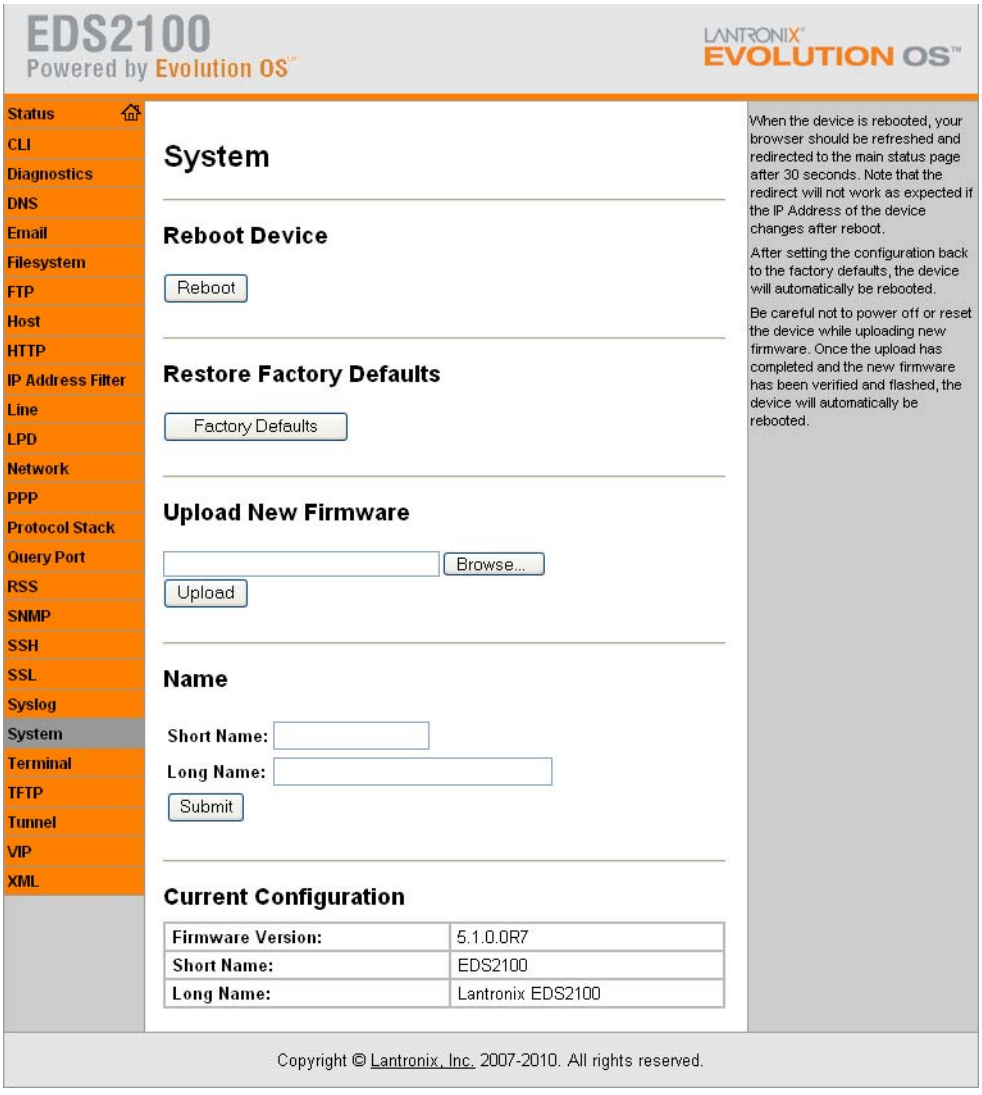

2. In the **Short Name** field, enter a short name up to 32 characters.
3. In the **Long Name** field, enter a long name up to 64 characters.
4. Click **Submit**.
5. Click **Reboot** to display the names.

# 16: Updating Firmware

Obtain the most up-to-date firmware and release notes for the EDS1100/2100 from the Lantronix Web site (http://www.lantronix.com/) or by using anonymous FTP (ftp://ftp.lantronix.com/). To upload new firmware, perform the following steps.

1. Click **System** in the Main Menu. Figure 16-1 shows the page that displays.

***Figure 16-1 System Web Page***




2. Click **Browse** in the **Upload New Firmware** section. The Choose File window displays.
3. Highlight the file and click Open.
4. Click **Upload** to install the firmware. The device automatically reboots on the installation of new firmware.

Alternatively, firmware can be updated by sending the file to the EDS1100/2100 over a FTP or TFTP connection.

# A: Technical Support

If you are unable to resolve an issue by using the information in this user guide, please contact Technical Support at the following web site or phone numbers:

**Technical Support US**
Check our online knowledge base or send a question to Technical Support at
http://www.lantronix.com/support.

**Technical Support Europe, Middle East, Africa**
Phone: +33 13 930 4172
Email: eu_techsupp@lantronix.com or eu_support@lantronix.com

Firmware downloads, FAQs, and the most up-to-date documentation are available at
http://www.lantronix.com/support.

When you report a problem, please provide the following information:

- Your name, and your company name, address, and phone number
- Lantronix model number
- Lantronix serial number
- Firmware version (on the first screen shown when you Telnet to the device and type show)
- Description of the problem
- Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem)
- Additionally, it may be useful to export and submit the XML Configuration and XML Status files

# B: Binary to Hexadecimal Conversions

Many of the configuration procedures require that you assemble a series of options (represented as bits) into a complete command (represented as a byte). The resulting binary value must be converted to a hexadecimal representation.

Use this chapter to learn to convert binary values to hexadecimals or to look up hexadecimal values in the tables of configuration options. The tables include:

- Command Mode (serial string sign-on message)
- AES Keys

## Converting Binary to Hexadecimal

Following are two simple ways to convert binary numbers to hexadecimal notation.

### Conversion Table

Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, treat the upper and lower four bits separately to produce a two-digit hexadecimal number (in this case, 4C).

Use the following table to convert values from binary to hexadecimal.

***Table B-1 Conversion Values***

| Decimal | Binary | Hex |
|---|---|---|
| 0 | 0000 | 0 |
| 1 | 0001 | 1 |
| 2 | 0010 | 2 |
| 3 | 0011 | 3 |
| 4 | 0100 | 4 |
| 5 | 0101 | 5 |
| 6 | 0110 | 6 |
| 7 | 0111 | 7 |
| 8 | 1000 | 8 |
| 9 | 1001 | 9 |
| 10 | 1010 | A |
| 11 | 1011 | B |
| 12 | 1100 | C |
| 13 | 1101 | D |

*Table B-1 Conversion Values (continued)*

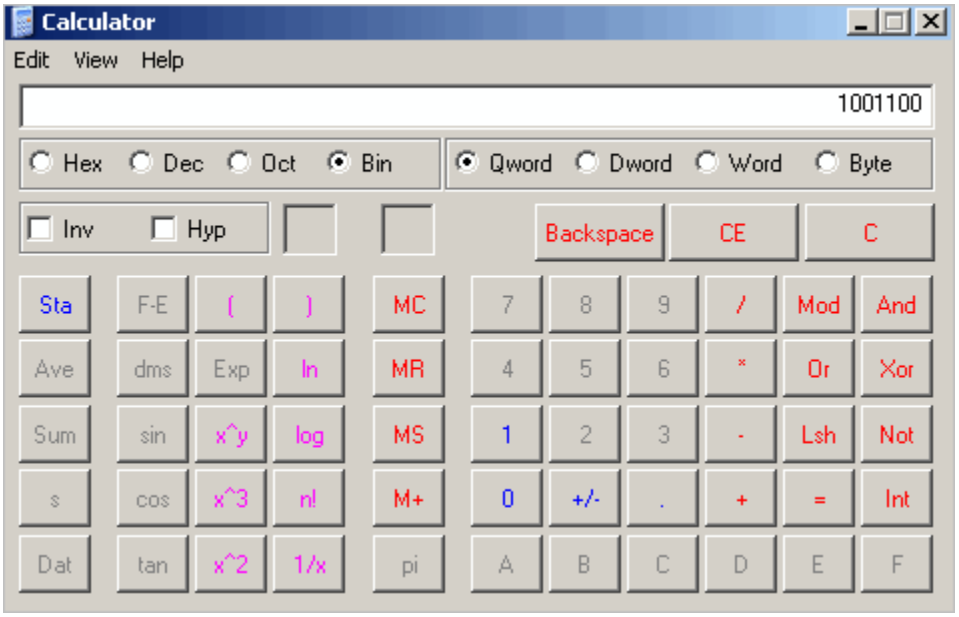
| Decimal | Binary | Hex |
|---|---|---|
| 14 | 1110 | E |
| 15 | 1111 | F |

## Scientific Calculator

Another simple way to convert binary to hexadecimal is to use a scientific calculator, such as the one available on the Windows operating systems. For example:

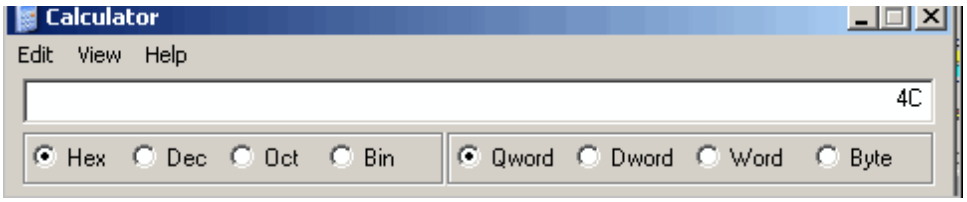
1. On the Windows Start menu, click **Programs > Accessories > Calculator**.
2. On the View menu, select **Scientific**. The scientific calculator appears.
3. Click **Bin** (Binary) and type the number you want to convert.

*Figure B-2 Scientific Calculator*


Calculator
Edit View Help
1001100
Hex Dec Oct Bin
Qword Dword Word Byte
Inv Hyp
Backspace CE C
Sta F-E ( ) MC 7 8 9 / Mod And
Ave dms Exp ln MR 4 5 6 * Or Xor
Sum sin x^y log MS 1 2 3 - Lsh Not
s cos x^3 n! M+ 0 +/- . + = Int
Dat tan x^2 1/x pi A B C D E F

4. Click **Hex**. The hexadecimal value appears.

*Figure B-3 Hex Display*



# C: Compliance

The following meet the ISO/IEC Guide 17050-1, 17050-2 and EN 45014 compliances.

**Manufacturer Name & Address**
Lantronix, Inc.,
167 Technology, Irvine, CA 92618 USA

**Product Name Model**
EDS1100/2100 Device Server

*Conforms to the following standards or other normative documents:*

**Radiated and conducted emissions**
FCC Part 15 Subpart B
Industry Canada ICES-003 Issue 4 2004
CISPR 22: 2005 Information Technology Equipment
VCCI V-3/2009.04
AS/NZS CISPR 22: 2006
EN55022: 2006
EN61000-3-2: 2006
EN61000-3-3: 1995 + A1: 2001 + A2: 2005

**Immunity**
EN55024: 1998 + A1: 2001 + A2: 2003

**Direct & Indirect ESD**
EN61000-4-2: 1995 + A2: 2001

**RF Electromagnetic Field Immunity**
EN61000-4-3: 2006 + A1: 2008

**Electrical Fast Transient/Burst Immunity**
EN61000-4-4: 2004

**Surge Immunity**
EN61000-4-5: 2006

**RF Common Mode Conducted Susceptibility**
EN61000-4-6: 2007

**Power Frequency Magnetic Field Immunity**
EN61000-4-8: 1994 +A1: 2001

**Voltage Dips and Interrupts**
EN61000-4-11: 2004

**Safety**
UL 60950-1
CAN/CSA-C22.2 No. 60950-1-03
EN 60950-1:2001, Low Voltage Directive (73/23/EEC)

### RoHS Notice

All Lantronix products in Table C-1 are China RoHS-compliant and free of the following hazardous substances and elements:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr (VI))
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

***Table C-1 Lantronix Product Family Names and Toxic/Hazardous Substances and Elements***

| Product Family Name | Toxic or hazardous Substances and Elements | | | | | |
|---|---|---|---|---|---|---|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr (VI)) | Polybrominated biphenyls (PBB) | Polybrominated diphenyl ethers (PBDE) |
| UDS1100 and 2100 | 0 | 0 | 0 | 0 | 0 | 0 |
| EDS | 0 | 0 | 0 | 0 | 0 | 0 |
| MSS100 | 0 | 0 | 0 | 0 | 0 | 0 |
| IntelliBox | 0 | 0 | 0 | 0 | 0 | 0 |
| XPress DR and XPress-DR+ | 0 | 0 | 0 | 0 | 0 | 0 |
| SecureBox 1101 and 2101 | 0 | 0 | 0 | 0 | 0 | 0 |
| WiBox | 0 | 0 | 0 | 0 | 0 | 0 |
| UBox | 0 | 0 | 0 | 0 | 0 | 0 |
| MatchPort | 0 | 0 | 0 | 0 | 0 | 0 |
| SLC | 0 | 0 | 0 | 0 | 0 | 0 |
| XPort | 0 | 0 | 0 | 0 | 0 | 0 |
| WiPort | 0 | 0 | 0 | 0 | 0 | 0 |
| SLB | 0 | 0 | 0 | 0 | 0 | 0 |
| SLP | 0 | 0 | 0 | 0 | 0 | 0 |
| SCS | 0 | 0 | 0 | 0 | 0 | 0 |
| SLS | 0 | 0 | 0 | 0 | 0 | 0 |
| DSC | 0 | 0 | 0 | 0 | 0 | 0 |

0: Toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

x: Toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

**Manufacturer Contact**

Lantronix Inc.
167 Technology, Irvine, CA 92618 USA
Phone: 949-453-3990
Fax: 949-450-7249

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